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ABSTRACT

This publication presents classroom activities for teaching about the world food shortage. These activities are organized by objectives, are multidisciplinary and cover the K-12 grade levels. The objectives listed include: (1) Describe some food chains; (2) Appraise the effect of soil conditions, geographic and climatic factors on the food industry; (3) Describe the role of transportation in the distribution of food; (4) Explain the relationship between food and population; (5) Relate food production and processing to energy use; (6) Suggest some solutions to alleviate world hunger; (7) Analyze the relationship between food and economics; (8) Investigate the political aspects of food distribution; (9) Analyze the relationship between agriculture and land use; and (10) Identify factors causing worldwide concern about food. The activities are organized under each objective by problem area, grade level, and subject or course of study. This publication is a part of the "Environment and Quality of Life" series of Computer Based Resource Units that have been develoged under the Elementary and Secondary Education Act, Title III. (MH)

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Environmental Education

FOOD - The Coming Crisis

Grades K- 12

SE 025 387

Produced by the New Jersey Council for Environmental Education in cooperation with the New Jersey Education Association

ENVIRONMENTAL EDUCATION

FOOD - THE COMING CRISIS

(Grades K - 12)

THE NEW JERSEY COUNCIL FOR ENVIRONMENTAL EDUCATION
at Montclair State College
Upper Montclair, New Jersey
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In Cooperation With

THE NEW JERSEY EDUCATION ASSOCIATION

Pursuant to

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FOOD - THE COMING CRISIS

INTRODUCTION

The activities in this book have been selected from a Computer Based Resource Unit entitled, "Food - The Coming Crisis." It was produced by the New Jersey Council for Environmental Education, a federally funded project directed by Dr. Edward J. Ambry at Montclair State College, Upper Montclair, New Jersey. Funds for the development of this unit were provided by the United States Office of Education under provisions of the Environmental Education Act, as amended by Public Law 93-279. It is the fourteenth unit developed by the Council and becomes part of the "Environment and the Quality of Life" series of Computer Based Resources Units, the first thirteen of which were developed under Title III, Sec. 306 Elementary and Secondary Education Act.

Edna Doll, Assistant Director in Charge of Curriculum, coordinated the production of "Food - The Coming Crisis" with the assistance of Deborah Healy, former member of the Council staff; Nancy Bowne, teacher in the Newark, N. J. Public School system; and Edward Bowne, Title I Coordinator and Reading Specialist of the Hillside, N. J. Public School system.

All the activities are related to learner objectives and are grouped for pupils at various grade levels. Not all objectives have activities for all grade levels. Teachers may adapt, adopt, correlate, separate or use these activities in a variety of ways which they determine will meet the needs of their students. Activities may be used with large groups, small groups or for individual instruction.

Also available at this time are three similar books containing student activities, entitled, "Energy - Technology" (grades 7-12), "Energy - Transportation" (grades K-8, and "Energy - Society" (grades 4-12). For information, write to the New Jersey Council for Environmental Education, Inc., Montclair State College, Upper Montclair, New Jersey 07043.

Teachers desiring more complete information on these subjects may request Computer Based Resource Units. CBRU's include activities, content items which serve as background information for teachers and/or students, measuring devices, and lists of books, pamphlets, articles and multimedia materials, all related to specific learner objectives. CBRU's are available to all New Jersey teachers through the combined efforts of the New Jersey Council for Environmental Education and the State Department of Education. Refer to the CBRU Resource Manual located in each school district and fill out the required CBRU Request Form.

Fourteen Environmental Education CBRU's have been developed by the Council with the aid of consultants and specialists in Environmental Education, and Curriculum Development Teams, composed of teachers from all grade levels, teaching in urban, suburban, and rural districts, representing all sections of New Jersey. It is the desire of the curriculum developers that these units provide for exciting and relevant learning experiences for students. They embody educational materials which allow teachers a wide selection of alternatives for classroom use and for individualized approaches to the needs of pupils in elementary and secondary instructional programs.

ACKNOWLEDGEMENTS

We wish to thank members of the Council who aided in the production of this book: William Harding, Marie Gostin, Arthur Thornton, and Lorraine Wirths.

Art work by Deborah Healy, free-lance artist.

FOOD - THE COMING CRISIS

INDEX

	Page
OBJECTIVES	
Describe some food chains.	1
Investigate the nutritional aspects of food: proteins, carbohydrates, fats, starches, etc.; food supplements and additives.	3
Appraise the effect of soil conditions, geographic and climatic factors on the food industry.	9
Describe the role of transportation in the distribution of food.	13
Investigate fresh and salt water sources of food, both natural and man managed.	16
Trace the changing life style of the farmer with its attendant impact on the environment.	20
Create some nutritional, tasty and economical meals for you and your family.	24
Describe how selected foods are grown, harvested and processed.	30
Explain the relationship between food and population.	32
Describe the implications of malnourishment.	35
Relate food production and environmental degradation.	38
Explain how technology has altered the production and procurement of food with attendant alteration of the environment.	40
Investigate labelling and other aids to the consumer.	43
Relate food production and processing to energy use.	46

	Page
Suggest some solutions to alleviate world hunger.	49
Relate dietary practices to selected ethnic, religious, geographic and/or age groups.	51
Analyze the relationship between food and economics.	55
Identify the roles of UNICEF (United Nations International Children's Fund), WHO (World Health Organization), FAO (Food and Agricultural Organization), FFHC (Freedom From Hunger Campaign) and other agencies involved in trying to alleviate world hunger.	58
Describe the implications and outcomes of the World Food Conference held in Rome.	60
Analyze the social and environmental implications of the Green Revolution.	62
Investigate the political aspects of food distribution.	64
Analyze the relationship between agriculture and land use.	66
Examine the impact of governmental regulations on the food industry and the consumer.	69
Identify factors causing worldwide concern about food.	71
Interpret how advertising creates demand and affects cost.	74
Examine the history of food from the earliest hunter-gatherers to the present.	78
Investigate the problems of hunger and malnutrition within the United States and some of the food programs designed to alleviate those problems.	82

OBJECTIVE: Describe some food chains.

PROBLEM AREA: Food Chains

GRADE LEVEL: K-6

GRADE LEVEL: K-3

SUBJECT: Science, Art, Language Arts

ACTIVITIES:

1. Draw a picture of a food chain; a grasshopper being snapped up by a lizard, with a hawk swooping out of the sky to capture the lizard - a worm, a chicken and a man, etc. Write a sentence or two to explain the food chain.

2. Draw a picture showing a food web with organisms from an environment near your school. Draw arrows from the sun to producers then to consumers. Draw a circle around two food chains in the web.

3. Herbivores are grass (vegetation) eaters. Carnivores are meat eaters. Omnivores are eaters of grass (vegetation) and meat. Put the words on a piece of paper and draw some illustrations for each.

4. Next to the names of the following animals write whether they are herbivores, carnivores or omnivores: man, lion, elephant, cow, dog, chicken, whale, sunfish, horse.

5. In a complete sentence, explain what a herbivore is, also a carnivore and an omnivore. When your parents ask what you learned in school, tell them!

6. Explain how dependent we are on a simple blade of grass. For example, sheep and cattle eat grass. We eat meat and milk. Small insects eat grass. Birds (chickens) eat insects. We eat eggs and chicken, etc. Go out and take a new look at the grass which is able to make its own food out of water and sunlight. That is more than we can do. Express what you find in a picture, poem or story.

GRADE LEVEL: 4-6

ACTIVITIES:

1. It is difficult to be in the right place at the right time to observe the food chain in action as organisms prey on one another. However, it is often possible to gather evidence showing what organisms have recently eaten. Since fish are readily accessible for study, have your students collect and preserve several different species of fish from ponds, streams or estuaries.

Also collect samples of other animals and plants, especially those smaller than the fish. Dissect the fish and do a stomach analysis to determine what food it has eaten recently. Use the sample food organisms to help you identify the pieces of food which you found in the stomach.

2. Go to the library and see if you can find some information on food chains. You might ask the librarian to help you. Bring the information back to the class.

3. Examine a food chain, for example--vegetation-mayfly larvae-trout-man. Discuss what happens if one step of the food chain is broken due to spraying of pesticides, pollution, man's carelessness, etc. What happens to the trout if we spray the brook to kill mosquitoes, but also kill the mayfly larvae? Do we always know the results of our actions? Present your findings in an artistic way - collage, water color, poster, etc.

4. Write the name of one plant or animal you have observed. Then in the week following, using observation and research, attempt to identify the observed plant or animal's place in a food chain. The food chain should be described in writing in as complete a way as possible.

5. Draw a food pyramid using the following data showing the number of organisms found in a farm pond: largemouth bass 56, sun fish 1100, caddisfly larvae 5000. Assume that on a particular day the farmer adds 500 additional adult sun fish. Draw a pyramid showing what the community would look like on that day and a second pyramid showing approximately what the community would look like one month later. Try introducing other variations to the situation such as a sudden addition of 100 bass or the introduction of a weed killer to the pond.

6. Draw two food pyramids. The first should depict a situation in a rural setting where hawks live in an environment with a population of rabbits feeding on a field of clover. In the second pyramid show the effects of a drastic reduction in the rabbit population caused by the spread of a disease.

7. Draw a picture showing what happens when a food chain is broken. Explain your picture to the teacher or a classmate.

OBJECTIVE: Investigate the nutritional aspects of food: proteins, carbohydrates, fats, starches, etc.; food supplements and additives.

PROBLEM AREA: Foods, food supplements and additives.

GRADE LEVEL: K-12

GRADE LEVEL: K-3

SUBJECT: Language Arts, Reading, Art, Social Studies, Health, Mathematics

ACTIVITIES:

1. On the bulletin board or blackboard, make a list of grains. Under each add the picture or name of a food made up of that grain. This could also be done with vitamins, kinds of food (proteins, carbohydrates, etc.) Add information on what each category does to keep our bodies healthy.

2. Cut a picture from a magazine of a food product. Paste it on a piece of paper. Under it write a paragraph describing the type of food it is (protein, carbohydrate, etc.), its vitamin content, and why it is good for you to eat. Do your writing on a scrap piece of paper first so that your illustrated page is really good. Make a booklet of the foods you and your classmates illustrate.

3. Make a "foods booklet" designed like an alphabet book. "A" is for apple, "B" is for banana, etc. This could be individually or on a class basis. Put down a sentence for each food telling why it is good for you or, possibly, not good for you. Older youngsters might put together this booklet for younger students.

4. Take a field trip to the zoo. Students should make note of what they see the animals eating. How does the animals' diets resemble what they would eat if they were in the wild? Students should do research to find out if they don't know. Is the zoo an environment the animals can function well in? Students will discuss what they feel their own needs would be if they were the particular animal chosen to study. Students as a follow-up to the field trip, should draw the particular animal they choose to study, and show it in its natural environment, with a food source it depends on. Tempera paint would be ideal, using red, yellow, blue, orange, brown, and green. Brushes of various sizes should be available, paint tins, and manila paper. An alternative

to tempera painting might be to construct their chosen animals in papier mache and to construct a small zoo (or jungle) for display.

5. Develop a class or student "Foods Dictionary." Such words as vitamin, starch sugar, carbohydrate, and protein should be included. If each word is written on one piece of paper, they could be arranged alphabetically. Illustrate where possible. Keep the book in the classroom as a reference.

6. Draw a happy picture of yourself. Around the edge draw some foods you eat which make you healthy and happy. Include one meat or fish, two vegetables, two fruits, egg, milk and bread.

7. Fold a paper in quarters. Draw four pictures of your favorite foods. Tell why each one is good for you. Hopefully you will not draw four candy bars. However, you may include one.

8. Using a calorie chart from your school nurse, have students make equations. One peach plus one apple equals how many calories? Two slices of bread plus one tablespoon of peanut butter equals how many calories? Two eggs plus one strip of bacon equals how many calories? Or do them backwards. Give total number of calories, and select foods which make up the total number. Use examples like these for a math or health quiz. Illustrate the work.

9. Make three columns on a piece of paper and label them as follows: Proteins, Carbohydrates and Fats. List eight foods in each category.

10. Make a table of the following information. Along the left side of a paper list three components of food: protein, carbohydrates, starch. To the right, and for each component, list three foods in which it is found. In the last column tell briefly the function of the component.

11. Ask the school nurse to explain how digestion takes place. If she is unavailable do some research in your library. Find out how food becomes YOU.

GRADE LEVEL: 4-6

SUBJECT: Health, Language Arts, Science, Art

ACTIVITIES:

1. There are four food groups: (1) meats and fish, (2) fruits and vegetables, (3) milk and dairy foods and (4) cereals. Divide a piece of paper into four sections and use these groups as the headings. Draw a picture of each of the following and put under the correct heading: Spinach, Pork Chops, Hamburger, Milk, Oatmeal, Wheaties, Bread, Eggs, Oranges, Cheese and Apples. If you want to, add more foods. Take your paper home and show it to your mother.

2. Limericks are fun to read and to write. Look up some examples in a literature book. Write a limerick that has to do with proteins, carbohydrates or fats. Print it neatly on a piece of drawing paper. Illustrate it. Hang it on your bulletin board.

3. Plan a puppet show or play with each puppet representing a certain food or food group. The plot? One puppet tries to convince the others and the class that he is the most important and nutritious food. Is there one food that is more important? Plan another puppet show or play with each puppet taking the part of a certain vitamin. The plot? One puppet tries to convince the others and the class that he is the most important vitamin.

4. Over a period of a week, write down everything that you eat each day. At the end of a week devoted to discussion of good nutrition and the main food groups, compare what you have eaten against the requirements for a healthy body.

5. Divide up into groups of two or three. One person in the group should write a short story about one of the nutrients that the body needs for good health, Then, taking the story, the next person should draw some pictures to illustrate the story, with the writer helping to draw, or explaining how he thinks his idea should look. If there is someone else to help, this person should put the drawings and story into a comic book form, designing a cover, and lettering a title on the book. If there are only two, then work together on doing this.

6. Write a two-page fantasy or science fiction story about what happened when someone actually "became what he ate."

7. Invite the Biology or Home Economics teacher into your class to speak about the main food groups basic to good nutrition. Construct from papier mache one representative food of the group he has chosen. (Bottle of milk, slice of cheese, yellow vegetable, green vegetable,

meat, fowl or fish, bread or grain product.) The sculptures may be constructed first of chicken wire, or on a base of inflated balloon or a cardboard form. Then, using flour paste glue, and strips of paper, well-soaked, or some of the newer methods such as Paris craft, build up the shape until it resembles the food you have chosen to represent. Paint with tempera paint, and detail the sculptures with magic markers, or crayons. They may be combined on a wall in the classroom from construction paper, be tumbling from a cornucopia constructed by the class from chicken wire and papier mache, placed on the shelves of a facsimile of a grocery, also constructed in the class.

8. Have a food quiz. Everyone in the class write up three questions having to do with food. Divide the class into teams in spelling bee fashion. Either a pupil or the teacher can read the questions.

9. Make a large diagram on the bulletin or blackboard. In the center draw or paste a picture of a healthy, happy family. Lable it "Man and Nutrition." Add circles around the sides pointing to the picture. Label each circle: Dietary Studies, Medical Studies, Chemical Analysis, Food and Crop Production, and Feeding Experiments. Around each of these circles add their subdivisions, i.e., under dietary studies, you could put adults, children, babies and families. Read the Content under Objective 2 of this unit for helpful hints. Make your diagram colorful and interesting. Perhaps you can think of another way of doing it.

10. Write a poem that names the role of one of the essential nutrients. Everyone in the class should try to make his poem rhyme. If you like, you can use the form of another poem that you know, as "Thirty days hath September," etc. Recite the poems for the class.

11. In a complete sentence, define correctly seven of the following: protein, organic food, additive, deficiency, minerals, hemoglobin, carbohydrates, starches, amino acid, malnutrition.

12. Read about the process of digestion in your health book. Make a report to your class.

GRADE LEVEL: 7-12

SUBJECT: Health, English, Mathematics, Social Studies, Careers, Science

ACTIVITIES:

1. Choose a vitamin. Research its value. Report to the class on its importance and discuss the foods which need to be eaten to obtain the minimum daily requirement.

2. Go to the library and select a book on diet and weight loss. There are many, and all are persuasive. Critique the book, keeping in mind the things you know about balanced meals. Do you agree or disagree with the author? Present your critique to your class.

3. Calorie count is important to people who want to lose weight, and also for nutrition. List twenty foods in descending numerical order according to calorie count. Make a graph of the results.

4. Taking a hypothesis that men and boys require greater amounts of nutrients and energy than women and girls, students will examine the causes for this. Some points to think of might include how traditional female and male roles influence the individual's daily physical activity, the types of work considered male and female, the types of foodstuffs popular with either sex. Does there seem to be exploitation of popular concepts by the media in selling products, (Manhandler's Soups, by Campbell, dietetic sodas always advertised showing a woman in a bathing suit, etc.) Following the discussion, class will examine their own tastes, likes and dislikes in food. Do they seem to adhere to what the media is saying?

5. Some people have been instrumental in adding to our knowledge of foods, nutrition and plants. Select one and do an illustrated biography of that person. You might consider Rene Reaumur (1683-1775) who studied digestion, Antoine Lavoisier (1743-1974), the "Father of Nutrition," Christian Eijkman, winner of the Nobel prize for his discovery of vitamin B, Melvin Calfin, who won the Nobel prize for his work on photosynthesis, Gregor Mendel, for his laws of heredity, George Washington Carver, for his uses of peanuts, etc.

6. Choose a recent or current issue for research concerning the use of food additives. The type of topic you might choose could include the use of red 2, compared to red 40, the dyes causing so much controversy, the use of hormones or antibiotics with beef cattle, and its effect on the

human system, etc. Compile as much information as you can, and present the development of the issue in the form of a paper to be read to your class. Class may question the student presenting his paper after he is finished.

7. Discuss with the class the use of additives to make foods easier to prepare. Each student should take one convenience food, and note the addition of all food additives. At home, and keeping note of the time of preparation and cost, each student should make two dishes; one using the convenience food, one making the same dish from "scratch." In class, the relative cost, use of time and number of additives should be compared. Class should then decide which they would prefer to use. One consideration that might make the process harder to assess is the possible difficulty students will having finding foods without additives to make the dish from "scratch."

8. Write a short paragraph on either the pro's or con's of food additives. The criteria for successful accomplishment will be that you can marshal enough facts and state them clearly to prove your thesis.

9. You are the editor of a newspaper interested in nutrition. Write an editorial which describes common nutritional bad habits (like having a lunch of french fries and Coke). Why is it unhealthful and what can be done? Read a couple of editorials first so you know the style. Criteria are facts, organization, clarity and appeal.

10. "Junk Food" is a term applied to foods having little or no nutritional value and which are high in calories. Make a list of some foods which you feel are in this category. Do you eat them? Why? Can you think of some substitutes which would be better for you.

OBJECTIVE: Appraise the effect of soil conditions, geographic and climatic factors on the food industry.

PROBLEM AREA: Natural factors controlling agriculture

GRADE LEVEL: K-6

GRADE LEVEL: K-3

SUBJECT: Language Arts, Science, Art, Social Studies, Reading

ACTIVITIES:

1. Have a discussion on how foods grow (potatoes, beets, peanuts, carrots grow underground; cabbage, beans, peas, tomatoes grow above ground; wheat, rice and rye are grown on stalks; apples, oranges and pears grow on trees.) Make a bulletin board or blackboard illustrating this. If you like, include animals also. Show people picking or harvesting foods. Make your illustrations so attractive you will not want to take them down.

2. Make or draw a series of pictures of various agricultural scenes (herds of cattle, a poultry farm, a field of corn, an apple orchard, etc.) Beneath each picture write a short paragraph about soil conditions, geographic and climatic features which affect the food depicted in the pictures. Make a little booklet of your work to share with the class.

3. Make a large map of the United States on the bulletin board. Show the various foods which our country produces - dairy products, beef, sheep, pigs, peanuts, corn, wheat, sugar, oranges, apples, fish, vegetables, etc. Discuss the map. The United States is most fortunate that it can grow such a variety and quantity of nutritious food. Compare our foods to other countries. Why is it possible for us to raise so much?

4. Borrow books about food from your local library. Set up a display table in your classroom. Examine these books and learn what you can about food - where it comes from, how it gets to you, the nutritional aspects, advertising, good meals, its effect on the land, ethnic beliefs about food, etc. At the end of a week write several statements showing what you learned about food.

5. Plant a potato, sweet potato or carrot in water by cutting off some of the root of the plant. Watch the plant sprout and grow. How is it possible for them to grow using only water? Start a plant for your mother, a

friend or a relative. It is especially nice in the winter on a windowsill. Draw a picture of your plant growing. Add a sentence to your paper telling about the plant.

6. Make a diorama showing the harvesting of some agricultural product. Be sure to show the topography of the land. Give some hints as to the climate (wet, dry, hot, cold, etc.) Is the harvesting done by hand or machine? What country does your diorama represent?

7. Write a story about a farmer who plants his seeds in the Spring and is faced with a drought. What happens to his crops? His family? Do rains come in time or will he be financially ruined? You might want to illustrate your story.

8. After looking at a series of teacher-presented pictures of various foods, select three and tell three facts about each. Pictures may show a specific food or an agricultural scene.

GRADE LEVEL: 4-6

SUBJECT: Science, Language Arts, Social Studies, Art

ACTIVITIES:

1. Look up in an atlas or encyclopedia those maps which show climate, rainfall and agricultural crops raised. Trace the relationships. Notice that most foods are grown in the temperate zone. Why? If you are artistic perhaps you would like to copy one of the maps.

2. Choose a state or country. Write a summary describing the climate, topography and people. List the food items grown there and the food consumed by the natives. What foods do the people raise? Why? Is there enough to go around? Does it make for an adequate diet? If not, are other foods imported? Which ones and from where? If there is a surplus of food what is done with it?

3. Look at a map of the United States and point out where certain foods grow. For instance, Iowa raises a great deal of corn. The soil, temperature and rainfall are ideal for this type of agriculture. Where are steers raised? Why? Do wheat and corn come from the same places? Why or why not?

4. There is a certain relationship between eating habits and geographical location. Make a booklet showing the

food products of your own state. Perhaps each class member could select one food to illustrate and write a descriptive paragraph, i.e., if you live in New Jersey - blueberries, cranberries, fish, tomatoes, apples, vegetables of all kinds. (After all, New Jersey is known as the Garden State)

5. Start an herb garden on the windowsill in the classroom, using commercially purchased seeds. As the plants grow, clip, dry and package into herb packages designed by students in the class. A display could be prepared with herb packages, and pen and ink or water color pictures of the plants. A short description of the historical use of herbs could be added. Use of the herbs might be obtained from a commercially prepared package or a cookbook. (Apart from taste considerations, herbs and spices were used for preservation and to disguise "gamey" food in pre-refrigeration days.)

6. Identify the foods most commonly used by the world's various populations. (Wheat, corn, millet, rice, soybeans, rye, various vegetables and fruit, beef, pork, chicken, fish and other foods.) Select some of these foods to discuss or study. Where did the foods originate? Did the plants and/or animals look as they do today? How did they change? Why? What part does the climate play in any differences (i.e., are there various kinds of wheat which grow in different kinds of climate?) Why do we now get larger yields per acre? How has natural and man-induced selective breeding worked? How much, for instance, have we increased milk production or egg laying per animal? Can this kind of thing go on indefinitely?

7. Recent articles suggest that the world is at the point of a major change in climate. The good weather of the last half century is giving way to a cooling trend. What could cause such a cooling trend and what might be the impact on agriculture and food? Research these problems, report to the group, and have a class discussion.

8. The United States imports half of the world's supply of sugar. List twenty-five foods that contain sugar (don't forget soda). Why do Americans use so much sugar? Is it good for us? Why or why not? What foods supply sugar naturally? Where do we raise sugar cane in the United States? What other plants supply us with sugar and what states produce these sources? Where does most of our sugar come from?

9. Conduct the following experiment to demonstrate the role of light in the food chain and the dependence of consumers on producers. Obtain eight glass jars (about 1/2" x 4") with leakproof caps. Fill all eight jars to within 1/2" of the top with pond water. Add a pond snail to two of the jars; to a second pair of jars add a green aquatic plant (Elodia); and to the third pair add both pond snail and a sprig of the plant. Add nothing but the pond water to the fourth pair. Take one jar of each pair and put them in a dark place. Put the second set of four jars under an artificial light. Observe the jars for one week and describe the changes. Explain the differences in the jars in terms of CO_2 and O_2 concentration, food availability and plant nutrient availability.

10. Identify, on a map of the United States, a minimum of three different climates and name two agricultural products from each area.

11. On a map of the world, name those countries whose land and climate are favorable for growing wheat and corn.

12. During the 1930's there was a serious drought and severe windstorms. Much of the land in Oklahoma and other western states was really blown away. This area was called the "Dust Bowl". It was a very difficult time for farmers and their families. Research this era in an encyclopedia. What were some of the causes? What happened to the farmers? What steps were taken to stop the erosion? Could this happen again? Portray that era in a poem, ballad, story, dramatization or art work.

13. If a portion of the school yard can be obtained for use by the class, students will plan, on paper, and then execute, if possible, an organic garden. Start the seedlings (being sure to use seeds suitable to location and zone) inside the school room three or four weeks before the warm weather in your area and, if possible, arrange with the cafeteria to use waste to make a compost heap for the following year. There are ways to speed organic breakdown in composting. The Chemistry teacher or an outside source should be able to supply the information. All things planted should be edible. Seeds from the garden may be saved, and dried for use the following year, to give students a sense of Nature's cycle. Students hopefully will not destroy the projects of other students, so the plot should be made safe from vandalism.

OBJECTIVE: Describe the role of transportation in the distribution of food.

PROBLEM AREA: Transportation

GRADE LEVEL: K-6

GRADE LEVEL: K-3

SUBJECT: Social Studies, Art, Language Arts

ACTIVITIES:

1. If possible, watch a line of trains going by. If not, try to find some pictures. What kind of foods are sent by train? Do the trains vary? What does a refrigerator train look like? What does it carry? What about those which carry liquids? (milk or molasses) What is the place of containerization in the distribution of food. Perhaps you would like to illustrate some of your work.

2. Visit a railroad terminal if possible (if not, do some research in your library). Find out as much as you can about refrigerated railroad cars. How are they made? How much do they cost? (Is this cost reflected in the price of food?) Where are they manufactured? What foods do they carry? Why are they good? Illustrate your findings with a crayon or pen and ink drawing.

3. Make a pictorial map of your community showing all the places that have to do with food and food distribution; supermarket, bakery, grain mill, warehouse, freight station, cheese factory, milk pasteurizing plant, etc. Show and explain your map to the children of a younger class.

4. Make a mural showing various phases of the fishing industry. Trawlers at sea, nets being used, icing the fish, scenes of a port, etc. Display the mural in the classroom.

5. Given pictures of five articles of food, students should identify the most likely means of transportation for getting them from growing area to consumer.

6. Visit a farm - it could be a poultry farm, dairy farm or one growing vegetables. Ask the farmer how his crops or products get to market. Write a report or draw some pictures as to how the farmer transports his farm products.

7. Fold a paper into four squares. In old magazines look for pictures depicting four different types of transportation. Cut out the pictures and paste them in the squares. Be able to tell the class which foods are transported by the pictures you selected.

GRADE LEVEL: 4-6

SUBJECT: Social Studies, Art, Language Arts, Science, Photography, Mathematics

ACTIVITIES:

1. Create a mural. On one side depict a series of crops growing. Put a picture of a supermarket on the other side. In the center show how various means of transportation are used to move food from one place to another.

2. Discuss how foods are transported. What kinds of foods go by truck, plane, railroad? Why are foods sent by different means of transportation? Illustrate with water colors, pastels or in any other art media a food being transported either by a modern or old-fashioned method.

3. Imagine that you are a truck driver taking a load of grapefruit from Texas to Vancouver on the west coast of Canada. Trace your route on a map. Write an article about your trip. There are lots of trucking terms you could use, for example, "Smokey Bear" for the police. Some of the road maps show trucking stops; rest and a chat with other truckers is possible. What kind of country would you be riding through? What would the weather be like? What crops would you see growing? How have the highways divided the land? Grapefruit are perishable--the ride would have to be a fast one.

4. Select a particular food and design (on a large piece of paper) the various ways in which energy is used to produce, transport and process the food. For example, bread--the production of grain requires fertilizer, the energy of the farmer, fuel for farm machinery such as tractors or reapers, transportation to the mill, energy for grinding, energy to mix and bake into bread and for packaging, etc. If several people in the class work together, a food mural might be accomplished. Perhaps small teams could work together. The Home Economics teacher might consider hanging the mural in her room.

5. Make a model of a refrigerator car and show how foods are packed inside it. Criteria is accuracy of detail.

6. Given pictures of at least five articles of food students should be able to locate where they came from on a map, and describe the means of transportation used in getting the products to the consumer.

7. Do a photographic essay on various means of transportation used in your town. You might have photographs of a bakery truck, refrigerator train car, airplane, milk truck, etc. Present your essay to the class.

8. Countries and states with large expanses of seacoast live on a different type of diet than areas like Kansas or Poland. Of course, this is modified somewhat by modern transportation but a difference does exist. Research the nutritional value of seafoods of various kinds. Make a bulletin board of your findings.

9. Select six or eight foods you like and locate on a map or globe their origins. (Steak from Texas, oranges from Florida, chocolate from Ghana, Africa, coffee from Brazil, etc.) Calculate the number of miles each of the products traveled. If you feel real smart, figure the distance using the metric system. Make a graph of your work.

OBJECTIVE: Investigate fresh and salt water sources of food, both natural and man managed.

PROBLEM AREA: Nutrients from the sea.

GRADE LEVEL: K-6

GRADE LEVEL: K-3

SUBJECT: Social Studies, Reading, Art, Science

ACTIVITIES:

1. Locate on a map the three most heavily exploited fishing areas of the world. Name two or three countries which fish extensively in these waters.

2. Draw a picture showing what you think a fish farm is like. Criteria is correct portrayal of at least three factors of fish farming such as location, division of tanks or growing areas, feeding of fish, catching and processing fish, etc.

3. Visit a fish store (phone ahead to make arrangements). What kinds of fish are for sale? How are they kept? Where do they come from? How are they shipped? Share your experience with a member of your family.

4. Visit an aquarium and study the fish. Which fish do we eat? Why are fish important as a food? See if you can find out some information about fish farming? Take some photographs or draw some pictures of your trip. Explain them to the class.

5. If possible, visit a fish hatchery (in New Jersey, one is located in Hackettstown). What part does a hatchery play in man's quest for food? Are fish raised only for game? Are fish raised and scientifically studied? Is it possible to use a hatchery as a "fish farm?" What does a fish farm do? Compare it to a vegetable farm.

6. Go to the library and see if you can find a book regarding the raising of fish, clams, oysters, inc. Read the book. If necessary, have someone help you. Give a report on the book to your class. Do you think fish farming is a good idea? Why or why not?

GRADE LEVEL: 4-6

SUBJECT: Social Studies, Science, Health, Art, Language Arts

ACTIVITIES:

1. In order to obtain more food from the sea, many countries have established "fish farms." Investigate oyster farms in Maryland and Japan. What type of protection is offered from larger hostile creatures? What type of food is given to the fish? How are the fish and oysters contained? Is fish farming a good idea? State some of the pro's and con's. If possible, visit a fish farm or perhaps a fish hatchery.

2. The average American eats only about eleven pounds of fish a year, compared to 200 pounds of meat, yet fish is very rich in protein. Plan and help prepare four fish menus for your family. Try them out over a period of time. Pick your favorite one, copy it and share it with a friend.

3. There are many resources in the sea. Fishing and whaling are two which affect the food supplies of some nations. (In Japan, whale meat is consumed by the population.) Obvious also are offshore production of oil and gas, and mining for minerals. Debate whether the resources of the oceans should be developed by private corporations, National government, the U.N., or some other agency.

4. During the past 30 years catches of mackerel, sardines, cod, haddock have decreased, while catches of shrimp, crab, clams and tuna have increased. Investigate the possible causes of these changes. Were these changes climatic or man induced? Did they have anything to do with foreign competition?

5. Distribution of potential sources of food from the sea is often limited by local customs, appearance of the food when it is purchased or by other social reasons. As a demonstration of this fact, ask your students to indicate their willingness to purchase, clean, prepare and eat the following organisms which are healthful, available foodstuffs currently used as food by people from other cultures: seaweed, eels, ocean pout (an eel-shaped fish found offshore in winter), squid, octopus (especially the tentacles), raw tuna fish, etc., and fish protein concentrate (a flour produced by grinding and chemically treating whole uncleaned fish.) Ask your students to compare their reactions to the preceding items with their reactions to such foods as lobster, shrimp, filet of sole and canned tuna fish.

6. Fish meal has become an important food item for farm animals. Investigate the procurement, processing and uses of fish meal. What country has become the

top commercial fishing country in the world because of fish meal? What type of fish is used? What ocean provides most of the fish used in fish meal? What type of farm animals get fish meal in their food? Fish meal was advocated as a supplement to human diets as it is rich in protein. Why didn't it work? Write a paragraph or two about your findings.

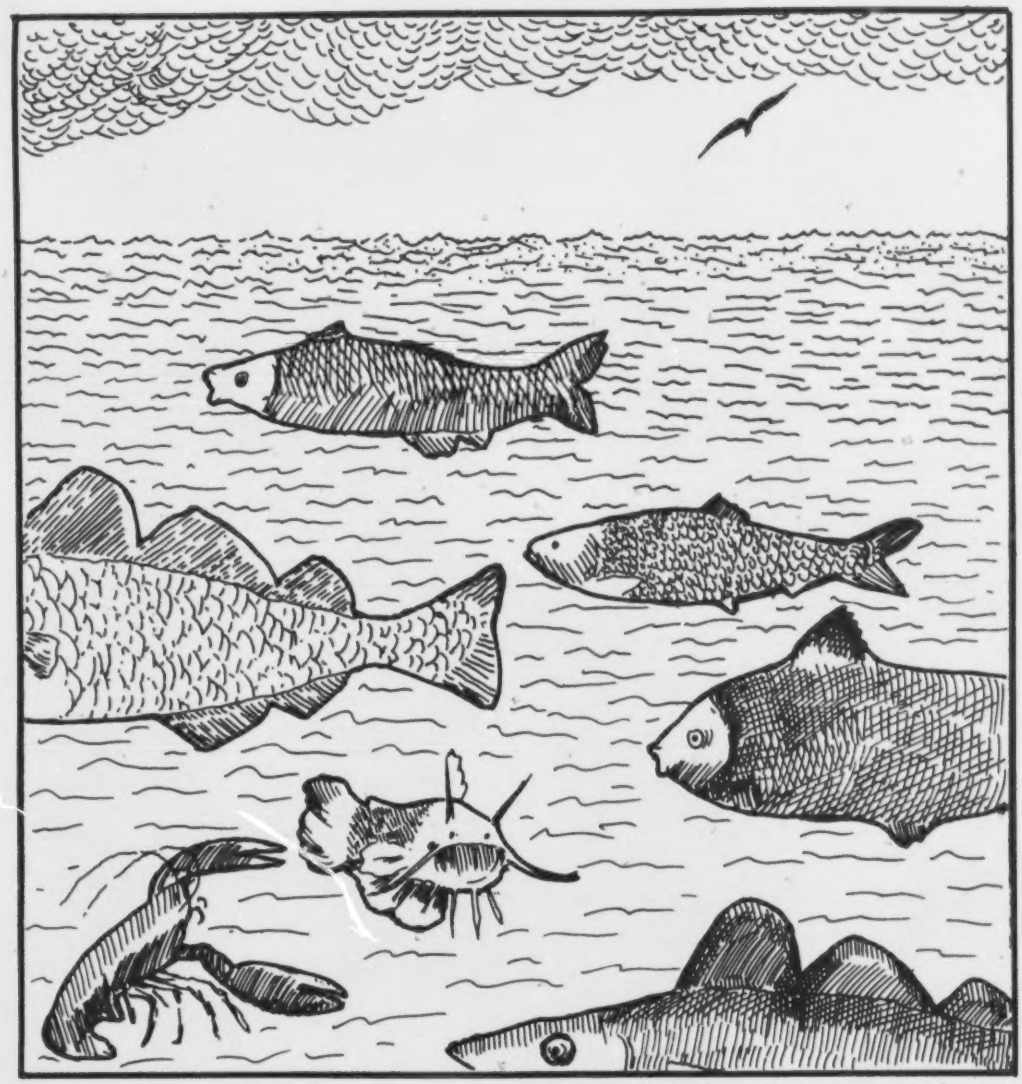
7. Write to the New Alchemy Institute, Falmouth, Massachusetts for information about their closed system for food production. The Institute is an adventure in alternate lifestyles. Your students can get a feel for the kind of protein production program the Institute uses by setting up three fresh water aquariums. In the first, they should place pond water which has turned green with algae growth after being exposed to intense light. In the second, place some Daphnia obtained from a pet store, a biological supply house or a local pond. Populate the third tank with several fish called Tilapia obtained from a pet store. With these three organisms - Algae, Daphnia and Tilapia - the staff of the Institute has established a recycling system which you can duplicate. Feed the algae to the Daphnia, the Daphnia to the fish, and occasionally siphon waste from the bottom of the fish tank to provide nutrients to the algae tank. Experiment with tank size, temperature, feeding ratios and "cropping" rates to design the most efficient system.

8. Identify some organisms commonly found in a saltwater marsh (e.g., algae, marsh plants, sandworms, clams, insets, killifish, eels, silversides, sandpipers, herons, humans, etc.) Have your students draw pictures of these organisms on a large piece of poster paper. Construct a food web by drawing arrows from the producers to the first order consumers (herbivores), from the first order consumers to the second order consumers and so on. When all possible combinations are identified, trace the path of a single food chain from producer to second, third or fourth level consumer.

9. There are many reasons why aquaculture is not widely practiced. State three of them. Explain each briefly.

10. Make a model of the ocean and show five or six ways in which it is being polluted with attendent results. Your work will be judged for imagination as well as for the facts you present.

11. Discuss micro-organisms, plankton, sea algae, and their value as a food source. Imagine and describe a new food product manufactured from microscopic sea life. Draw a label for the new product, showing the product and listing the nutritional contents.



OBJECTIVE: Trace the changing life style of the farmer with its attendant impact on the environment.

PROBLEM AREA: Changes in farmers and farms.

GRADE LEVEL: K-12

GRADE LEVEL: K-3

SUBJECT: Social Studies, Language Arts, Art

ACTIVITIES:

1. Visit a farm. Talk to the farmer. How long has he worked on his farm? What things does he grow? What tools does he use? What things does he do in a different way compared to ten or twenty years ago? Perhaps you can make a tape recording of your visit to enjoy with your parents or classmates. Illustrate your tape with slides or pictures you have drawn.

2. See if you can find someone who used to farm years ago. Perhaps a grandfather of someone in your class. Invite him to come in and tell the class how he farmed, what crops he raised, the tools he used, etc. Maybe you could give him the questions a few days before he came in so that he could think about them. Remember your manners when he comes.

3. In modern dairies machines have taken the place of milkmaids. Visit your local dairy farm. Talk to the farmer about the machinery. Ask about the cow's diet, pasteurization, etc. What regulations are there? Make a list of all the dairy products you can think of and illustrate them. Have a dairy party with home-made ice cream. Invite another class.

4. Do some research on farm tools used years ago. Bring some to class if possible. Do a series of drawings depicting these tools. Eric Sloan has several books you might find interesting on old tools, old barns, etc. As a matter of fact he has a museum of this type in Connecticut. Perhaps you could arrange a visit.

5. Shown a series of pictures of farm life, student will be able to assemble them in a correct time line from historical to modern.

GRADE LEVEL: 4-6

SUBJECT: Language Arts, Art, Social Studies, Mathematics

ACTIVITIES:

1. Draw a picture of a farmer plowing his fields as he would have 50 years ago. Draw another picture of a

modern farmer working his farm. Criteria is accuracy of perception, i.e., the farmer 50 years ago might use a plow; today's farmer uses a tractor.

2. Find a book about a farm in your library. Bring it in to your class and read some of the most interesting pages to the other students.

3. Everyone in the class should write one sentence about a farm and draw a picture illustrating the sentence. Put all the pictures and sentences in a large notebook and keep it on the library table in your room. Practice reading the sentences to each other. If you have trouble with a word, ask the person who wrote the sentence. As you look at the pictures, determine whether the farm is a modern one or an old one.

4. Explain to a younger class how a food which you have selected is grown, harvested and processed. Plan to take about 15 minutes, with time for questions. Be sure to use illustrations--either your own or some you have selected from a library collection.

5. You are spending part of your vacation working on a farm. Write a letter to a friend at home describing what you are doing. What time you must get up, the duties you perform during the day, and how your job is contributing to the country's food supply. If you wanted to, you could illustrate your letter with little drawings along the margins.

6. Make a model of a grain elevator. Explain how it works to your class.

7. Make a graph showing the number of people a farmer could feed in 1850, 1900, 1950, 1960, 1967, 1972. (1850 - 4 people, 1900 - 7 people, 1950 - 15 people, 1960 - 26 people, 1967 - 42 people and 1972 - 53 people.)

GRADE LEVEL: 7-12

SUBJECT: English, Social Studies, Photography, Manual Arts

ACTIVITIES:

1. Do a photographic essay either with slides or movie film at a farm near your home. If you live in a city you may have a journey to make, but there are still working farms in many areas. Find out as much as you can about the farm, its crops, and the life style of the farmer. What are the chances of survival for this farm in 10 years, 20 years? Present your essay to your class or other group. Include a musical background.

2. Write an essay on the pro's and con's of agribusiness. Agribusiness, a fairly new term, stands for huge farms made up of thousands of acres, and run like a business rather than a farm. Big business is now interested in the big business of farming. The Tenneco Oil Company, for instance, produces fertilizers and farms 3,800 acres of grapes, 1,850 acres of almonds, 900 acres of fruit and owns much more land than this for future expansion of other crops.

3. After reading the article, "One Day on a Kansas Farm," by Stephen Singular in the Reader's Digest, April 1976, write a poem, ballad or song illustrating the difference between how the farm family lives as portrayed in the article, compared to a farmer's life 50 years ago. Criteria will be comparisons in technology, energy, tools, fertilizers, things a farmer today must know, land use, use of money, etc.

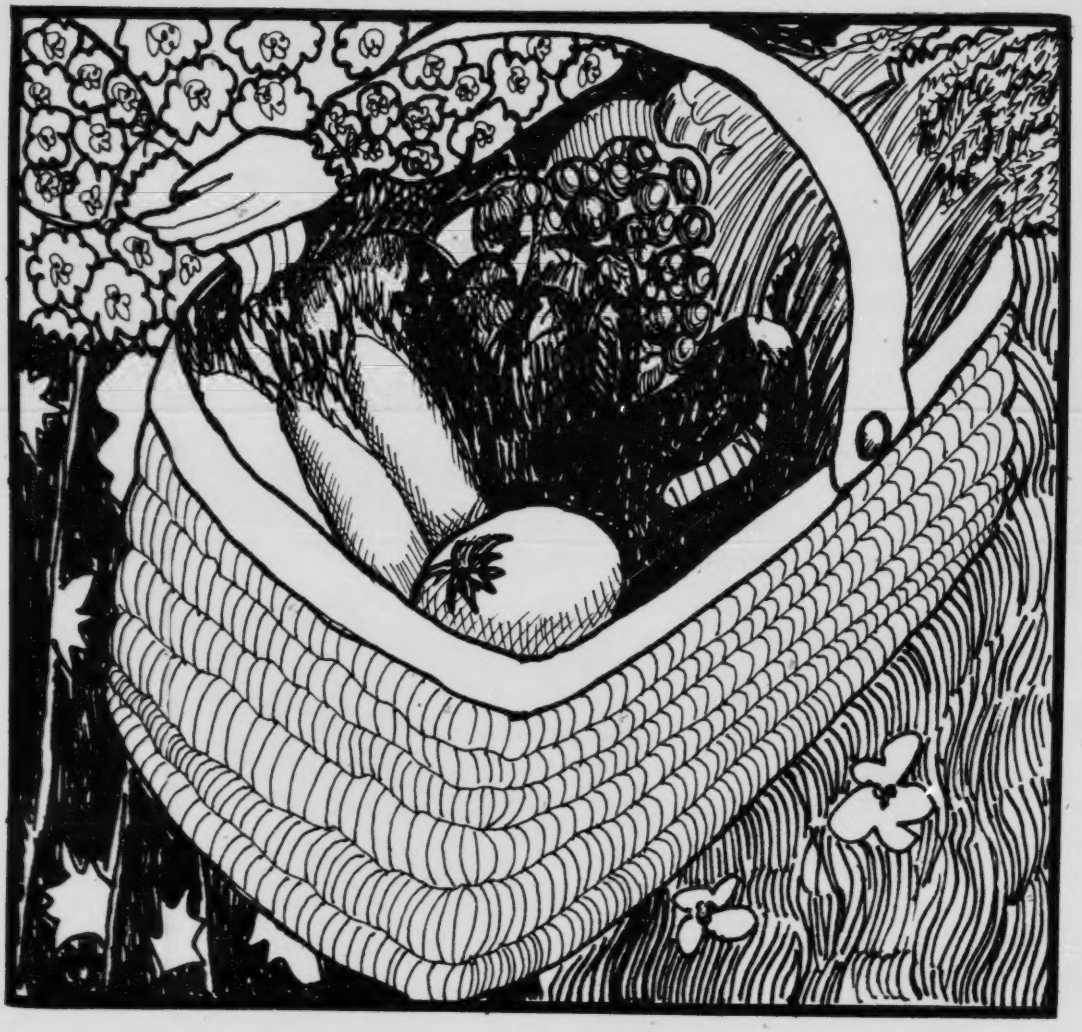
4. To raise a good crop of vegetables, one must do certain things correctly, whether he is a farmer or a backyard gardener. Name at least five. You could use the article "Vegetable Gardening: Double Your Yield," in the Reader's Digest, April 1976. The author mentions sixteen.

5. Discuss what estate and death taxes are and how they make it increasingly difficult for farm families to keep their land. (Federal law exempts the first $60,000 of an estate from taxes. When the law was written in 1942 few farms were assessed at that figure. Now, land prices are climbing sharply. As cities expand, they absorb farmland at highly inflated prices and convert its use to housing developments and shopping centers. The land is assessed at its commercial value rather than for its agricultural use. This high tax results in farmers having to sell their land. (From an article in the New York Times, Sunday, Feb. 15, 1976)

6. Do some research in the back files of newspapers such as the New York Times and find out what new taxes are being proposed to help farmers. One proposal would tax farms at their farming value rather than real estate value. Present your findings to the class.

7. Make a model or a drawing of a threshing machine. Explain how it works to your class. When was it invented? By whom? In what states is it widely used? How much hand labor does it save?

8. Research the National Farmer's Association. In what way does the Association pose an alternative to the trend of huge businesses owning thousands and thousands of acres of farm land and controlling every phase of food production from the ground to the store?



OBJECTIVE: Create some nutritional, tasty and economical meals for you and your family.

PROBLEM AREA: Creating meals.

GRADE LEVEL: K-12

GRADE LEVEL: K-3

SUBJECT: Health, Language Arts, Mathematics, Art

ACTIVITIES:

1. Select some colorful pictures from magazines which would portray a balanced meal. Glue them on tough cardboard. Cut up the cardboard into pieces which create a jig saw puzzle. Keep each puzzle in a separate envelope. Present them to a younger class explaining the nutrition of each meal.

2. Help your mother prepare a tasty, economical and nutritious meal. Tell the class about your experience.

3. Look through some magazines and find pictures that make up a balanced breakfast, lunch or dinner. Make a collage of the pictures. You may, if you like, add other features - a handsome border, art work, or other related materials coordinating the pictures. Happy, healthy children or people may also be used. Display your collage in your classroom.

4. Did you ever make peanut butter? It's easy. Shell a bunch of peanuts and take off their red skins. Pour them into a blender. Decide if you want crunchy or smooth peanut butter and press the proper button. Add a little salt. Have a party with the results or make peanut butter for some little children. Peanut butter is very healthy as it contains lots of protein.

5. Make a vegetable soup, or a vegetable or fruit salad in your class. Different students can bring in various foods. Put a list of them on the board. Classify them as to what kinds of food they are, the vitamins they contain, and why they are good for you. (e.g., carrots are carbohydrates, contain vitamin A and are especially good for the eyes.) Eat the salad!

6. Plan a week's menu for your family, keeping in mind the necessity of providing representation of each food group. (Meat group, two or more servings; vegetable and fruit group, four or more servings;

milk group, about three servings for children, four servings for teenagers, two servings for adults; bread and cereal group, four or more servings.) Students should compare their menu with what they actually do eat in the space of a week.

GRADE LEVEL: 4-6

SUBJECT: Health, Language Arts, Mathematics, Art, Science, Photography

ACTIVITIES:

1. As a class plan a good breakfast which is nutritious, economical and tasty. Maybe the nurse, home economic teacher or dietitian will help you. Some morning come to school early and have breakfast together.

2. Invite the home economics teacher to speak to your class about nutrition. Have some questions ready to ask her. Plan a simple balanced meal for your class, prepare and eat it at school Perhaps you will need the help of some mothers. Have a picture taken and write up the story for your local newspaper.

3. Plan a class picnic. Make a list of foods that you think would be good. Then, check to see how nutritious they are. Do they fall into the "junk food" category? Eliminate those which contain empty calories and keep only nutritious foods. If possible, go on a picnic and eat the good foods which you have selected.

4. Make a poster to illustrate the proverb, "Waste not, want not." Your success will be measured by how clearly you can show what the words mean. Display your poster in the cafeteria or other conspicuous place.

5. Draw a food web and a food pyramid with you at the top of the pyramid. Consider what you had to eat for breakfast, lunch and dinner for the last week, and include the plants and animals from which the foods in your web were obtained. Based on the amount of food you consumed during the past week, construct a pyramid which accurately shows the relationship between the various steps in the producers and consumers.

6. Play the game called "Super Sandwich," Rappaports Bazaar, 1381 Third Avenue, New York, N.Y. 10021. $12.95. See how you do on planning a balanced diet and how much you learn about nutrition.

7. Make some pea or bean soup with a leftover ham bone. It should have a little meat on it, but you do not need very much. Soak two cups of split green peas overnight in two quarts of water. Boil them in the same water. Drop in the ham bone, a few peppercorns, and a little salt. Add 1/2 cup chopped onion, 2 cups of celery with the leaves (these are very nutritious and should always be saved to add to soups or salads), add two sliced carrots and simmer for at least an hour. Remove the bone, cut off the meat in very small pieces and add it to the soup. Delicious! If you wish you can strain the soup through a sieve or food mill which will make it very smooth. Add milk to thin it a bit. Now you have created something tasty, nutritious (lots of protein in peas) and economical. It will serve six.

8. Working with your school dietitian, follow the school lunch menu for a week, charting the nutritional value every day, by parts of the meal. Post in the classroom a scoreboard showing how the lunches rate. Every one should take a turn doing this, looking up the food served to see how balanced and nutritious a meal is served. Students should devise a rating system which includes nutrition, appearance, balance, flavor, aroma, etc. Sometimes, in spite of a meal being nutritious, attractive, flavorful, etc., children still do not like them. Why?

9. Do a photographic essay on the preparation of a tasty, nutritious and economical meal. Prepare a narration and/or music to accompany the film. This can be a series of still shots, a slide show, or a movie. Share your work with your class or a group of parents.

10. What makes a balanced meal? Choose one to illustrate. It might be breakfast, lunch or dinner. You can work with papier-mache, clay or crayons. Think of the four groups of foods (meat and fish, cereals, fruits and vegetables, milk and dairy foods). Criteria is to represent all groups.

11. The principle of a mobile is balance. Good meals and mobiles share this attribute. Construct a mobile of a good meal using pictures from magazines, ones that you have drawn, or papier-mache reproductions, i.e., a breakfast mobile might include orange juice, eggs, bacon, toast and beverage. Hang your mobile where it will constantly remind you to eat well balanced meals.

GRADE LEVEL: 7-12

SUBJECT: Health, Home Economics, Photography, Economics

ACTIVITIES:

1. Do a photographic essay on selecting nutritious, wholesome and economical foods. You can go to a supermarket, a farmer's stand, a food co-op, or possibly all three. Talk to the people who serve you. Perhaps you can record what they say and use the recording or script in your essay. Show your masterpiece to a group of parents.

2. Make a cookbook of easy-to-make, nutritious and economical dishes. Such things as stews, soups, breads, chicken dishes and those using chopped meat and inexpensive cuts of meat could be included. Add illustrations if you want to. Reproduce the cookbook and distribute free or at a small charge to cover expenses.

3. You can make soup out of beef, lamb or turkey bones left over from a roast. Put them in a large pot and add water. Cut up some onions, carrots and celery. Add barley or rice and a can of tomatoes or even tomato soup. You will need to "doctor" this up to enhance its taste. Salt, pepper, any spices you like or bouillon cubes can be used, but be careful of the bouillon cubes--they are salty.

4. Chicken is often reasonable to buy, especially if you purchase them whole and cut them up yourself. They are easy to do. First, cut off the legs and thighs, then the wings. If you follow the line of the ribs, you can separate the breast from the back. A sharp knife is needed, poultry shears are handy, if available. The stomach, gizzard, heart and neck can be used for soup. Just boil with a little water, carrot, celery leaves, onion, salt and pepper and add a little rice. You can fry the livers separately. They are delicious on toast. The chicken can be fried, baked or cooked in many ways. Ask your home economics teacher, your mother or another person who cooks for recipes.

5. Divide the class into groups of 4 or 5. Each group, using commercially prepared vegetable protein meat substitutes, should prepare an appropriate dish (a casserole, meat loaf, chili, etc.). (The teacher should obtain the meat substitute.) Following the activity, the class should sample the various dishes and evaluate the substitute. The importance of protein in the diet should be discussed, as well as the relative values of animal and plant protein in the diet. Also, the cause

of the higher expense of meat protein should be demonstrated by showing the positions in a typical food chain of both plant and animal protein. What advantages do vegetable proteins have over animal protein? The class might do a follow-up activity of preparing another meal with the vegetable substitute.

6. "Waste not, want not" is an old-fashioned proverb that may be returning to use since food is now so expensive. Discuss the meaning of the proverb and relate it to your own use of food. Look around you in the lunchroom of the cafeteria. Are foods being wasted? Check with your family. How are leftovers used? Check your family's buying habits. Is more food being bought than used? How could your family save? Design a poster using the proverb.

7. Teenagers, because of rapid growth and body changes, are vulnerable to diet deficiencies. Write a humorous, but all too truthful ballad or story about poor Theodora, who loved chocolate and broke out with acne, who had a ring around her middle from french fries, and whose blood turned to brown sugar as she gobbled cake, etc., etc. Share your ballad with your class.

8. If you have some leftover lamb, gravy and mashed potatoes make a Shepherd's Pie. You will need 3 cups cubed leftover lamb, 3 cups of gravy, 2 tablespoons of minced onions, 3/4 cup of sliced celery and leaves, a minced clove of garlic, 2 tablespoons of butter, 1/2 cup of chopped parsley, 2 beaten eggs, and 3 cups leftover mashed potatoes. Saute the onion, celery and garlic in butter for ten minutes. Stir in the lamb gravy and parsley. Add the eggs to the potatoes. Line the sides of a casserole with potatoes, pour in the lamb mixture and spoon the rest of the potatoes over the top. Bake at 350^{o} for about thirty minutes. This recipe will serve six.

9. Plan a week's menu for one person using no meat, fowl or fish - only use those things acceptable to someone on a vegetarian diet. Things to consider are: whether the meat substitutes are complete proteins (i.e., do they contain amino acids which the body cannot manufacture?) How difficult is it to plan a meal with variety and balanced nutrition within these restrictions?

10. Be observant for economical cuts of meat. Chuck is often a good buy. Select a lean chuck steak. After you get it home, trim off the fat and use the bones and

use the bones and meat for soup. Or dice the meat and use it for stew. If the steak is a good one, you might consider pot roasting it, or if you are determined to use it as a steak, as the name implies, either treat it with tenderizer or marinate it in soy sauce for a half an hour or so before cooking it.

11. Plan a three-day diet for yourself, including snacks, which will suit both your taste and your body's needs. Live on the diet. Report your experiment to your class. Could you feel any differences in general health, pep, disposition, etc.?

OBJECTIVE: Describe how selected foods are grown, harvested and processed.

PROBLEM AREA: Food production

GRADE LEVEL: 4-6

SUBJECT: Social Studies, Language Arts, Art, Science

ACTIVITIES:

1. Divide a paper into four sections. On each make a drawing of one stage in the growth or processing of a particular food, (i.e., 1. wheat growing in the Spring, 2. threshers cutting it in the Fall, 3. going through the mill, 4. a loaf of bread). Make a booklet of all the drawings and keep them in the library as a reference. Explain your pictures in a sentence or two.

2. Make a frieze showing how milk is produced, processed and delivered. The class can be divided into groups, each group working on a small segment of the frieze. Hang the completed frieze in the hallway.

3. Choose one type of food and carefully outline every step of its production from seed to purchase. If desired, students may either show the process in comic strip form or by way of a written essay.

4. Write and illustrate the story of an apple from the time the tree was planted to the time the apple reached your hand. Make a booklet of your work. Include a few recipes for apple use. The same could be done with any product. Give the book to your mother, grandmother or aunt.

5. Make a model of a machine used on a farm either to grow, cultivate or harvest a product. You might choose a tractor, potato picker, hay bailer, corn picker, thrasher, etc.

6. Imagine that you are a member of a threshing crew. The threshers--12 of them--cut wheat going from Texas to the Canadian border as the wheat ripens late in the summer. Write up a diary telling of your adventures. Read it to the class.

7. Select a food which we import and do some research on it. Write and illustrate a report on this food. Where does it come from? How is it raised, harvested

and processed? Transported? What part does this crop play in the economy of the country from which it comes?

8. In an encyclopedia or other source, look up a particular food--anything from chocolate to cereal. Make an outline of how the food is grown, harvested and processed.

9. Evaporation of water from leaves is called transpiration. Use a pair of watch crystals to demonstrate that water is constantly given off by a leaf through the stomates. Fasten small watch crystals on either side of a leaf with Scotch tape around the crystals. Seal the edges with petroleum jelly to prevent air and moisture from leaking in or out. Leave the plant in the sun photosynthesis will continue. Water vapor will be released through the stomates and condensed on the watch crystals. Compare watch crystals to see which side of the leaf releases most water.

10. The fact that chlorophyll is green in color is an advantage to the plant. Conduct the following experiment to demonstrate the advantage of a dark color (green) over white as a sunlight absorber. Use a green magic marker to draw a leaf on a piece of white paper. Color the leaf entirely with the marker. In the out-of-doors on a sunny day hold a small magnifying glass in a position so that its beam of light is focused on the paper. Starting at one edge of the white paper, move the focused beam across the paper so that it passes over the drawing of the leaf. As it does the paper should burst into flame showing that the darker color absorbed more of the sun's energy.

11. In most plants the simple sugars resulting from the process of photosynthesis are converted to starch for storage in the root systems. When this starch is exposed to a solution of iodine, it turns blue-black. The easiest, most accessible item to test for the presence of starch is the potato. Simply peel or slice the potato and add a drop or two of the iodine solution and wait for the blue-black color to appear. Write up your experiment and illustrate it.

OBJECTIVE: Explain the relationship between food and population.

PROBLEM AREA: Population

GRADE LEVEL: 7-12

SUBJECT: Language Arts, Social Studies, Home Economics, Family Planning, Mathematics

ACTIVITIES:

1. Discuss the following: The imaginary country of Lohohasa is of small size. Its surface is mountainous and it is subjected to a monsoon climate. The birthrate is high and over 2,000,000 people live in the country. Many are starving. Country B has some surplus grain which it may need at a later date, or it may be needed by a country closer politically than Lohohasa. Should country B send their grain to Lohohasa? How much of it? Should it be free? If they don't send it, 50,000 people in Lohohasa will starve. If aid does come to Lohohasa every year, will they become dependent on it? Even with aid, if the birthrate keeps on increasing what will happen to the food as it is distributed? Would it be better that 50,000 starved now than twice that many in the year 2000? What alternatives are there?

2. Do some research on countries where large families are the rule. Why do people feel they need large families? (In India a Hindu wants a son to light his funeral pyre.) In other places children are needed to work in the fields. In still other countries infant mortality is so high that to insure having three living children a couple may have as many as ten. Given these reasons does it make you more sympathetic about large families? What can you say about the relationship of numbers of people and food supplies? Can you suggest any solutions?

3. Read Isaac Asimov's book, "Earth, Our Crowded Spaceship," 1944, John Day. The author explores the problems faced by Earth's inhabitants as the population increases and food, land and energy become scarce. Write a synopsis of the book and pass it around for others to read.

4. See the film; "The House of Man, Part II, Our Crowded Environment" (Encyclopedia Britannica Education Corp.) Discuss areas of concern resulting from overpopulation, housing scarcity, pollution, food shortages, etc. What solutions does the film suggest? Do you think they will work? Why or why not?

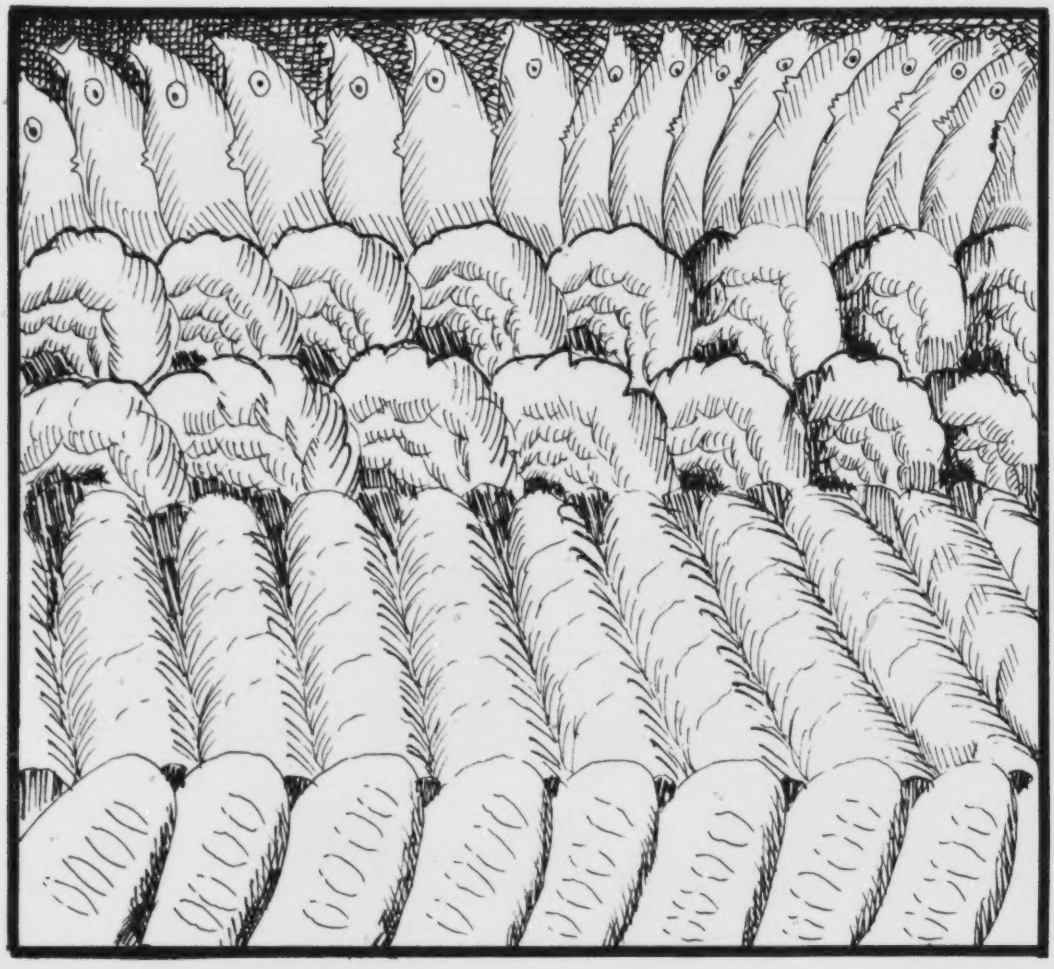
5. There are many suggested ways of keeping populations smaller. Tax laws could favor single people, bonuses could be given childless couples. More jobs could be open to women. Sterilization of men and women might be advocated. Select one topic and do some research. Is the program being carried out anywhere that you know of? What are the good points? What are the poor points? Share your paper with your class.

6. To demonstrate the utility of an age pyramid in the study of food chains, plot the following data of a farm pond which contains large-mouth bass, sunfish and mosquito larvae. Assume that the bass feed only on the sunfish, which feed only on the mosquito larvae. Year 1 - 50 bass and 300 sunfish are added to a farm pond which has 3000 mosquito larvae in it; Years 2-5 - No bass or sunfish reproduction, 1500 mosquito larvae; Year 6 - 15% increase in sunfish population, 10% increase in bass population, 5% loss of larvae population; Years 7-9 - 5% increase in bass population, 20% increase in sunfish population, 5% reduction in larvae population; Year 10 - No increase in either sunfish or bass population, 2% decrease in larvae population. Draw an age pyramid for each year (1 through 10) for each organism. Explain the variations observed.

7. Imagine you are a cub reporter on the staff of the New York Times. You have just been given a chance to prove how good you really are. Your assignment is to investigate the fact that food supplies are dwindling due to weather conditions, increased population, less available land for use, more demand which reduces the surplus, etc. Write an article or a series of articles explaining the problems. Try to include personal incidents, graphs or other means of making your article interesting. Post your work on the bulletin board.

8. Debate the following: Agreed that although there are over four billion people on the Earth with a projected seven billion by the year 2000, there will always be enough food to feed the people. You will need to do some research to find out both sides, since there is no simple answer as to how many people the earth can feed. Many people think technology is the answer. Others are sure Malthus was correct when he theorized that population would outrun food supplies.

9. In a speech before the U. N. in 1964 Pope Paul VI stated, "You must strive to multiply bread so that it suffices for the tables of mankind, and not, rather, favor an artificial control of birth, which would be irrational, in order to diminish the number of guests at the banquet of life." React to this statement as a ghetto resident. Criteria: The student's reaction should be supportive of the notion. He might cite the argument of "Racial Genocide" put forth by some not favoring population controls.



OBJECTIVE: Describe the implications of malnourishment.

PROBLEM AREA: Malnutrition

GRADE LEVEL: 4-12

GRADE LEVEL: 4-6

SUBJECT: Social Studies, Health, Art, Language Arts

ACTIVITIES:

1. The early discoverers and explorers of the New World (America) were often plagued by scurvy, a disease common to sailors on long voyages. Cartier, the French explorer, wrote in his journal that his crew was healed by the Indians who fed them the boiled joice of the leaves of a tree. Look up this story in your history books. What type of tree did the Indians use? Why did the remedy work? A shoe box "movie" could easily be made depicting this interesting story.

2. Ask your school nurse or doctor to talk with your class about malnourishment and its effects on health. Is it true that we are more prone to colds and other infections if our diet is not balanced? What happens in extreme cases? Make a list of questions before your visitors arrive.

3. Make a list of nutrients (proteins, minerals--such as iron and calcium --and vitamins A, B, C & D.) Next to each write what the nutrient does for the body. In the third column explain the foods which supply the nutrient. In the fourth column describe the effects when the body is deprived of thus nutrient. Make your report as colorful as possible. Refer to it often to guide you in your own eating habits.

4. It is said that more people die of malnutrition than of starvation. Do you believe this is true? Why or why not? See if you can find some information to help you prove your point.

5. Correctly define the terms: undernourished, malnourished and starvation to your teacher or to the students in your class.

6. Write a paragraph on one of the effects of malnutrition such as brain damage, infectious diseases, stunted growth, aging, etc. Your paragraph should have three parts: causes, effects and possible solutions.

GRADE LEVEL: 7-12

SUBJECT: Health, Home Economics, Social Studies, Economics

ACTIVITIES:

1. Compile a collection of newspaper and magazine articles that have to do with food, nutrition, malnutrition, starvation, etc. Paste on paper and place in a loose leaf binder. Use as a class or school reference. As articles are added they should be reviewed for the class.

2. Select a country to study in terms of malnutrition. In your study consider the size, topography and climate. Also consider cultural traditions and socio-economic characteristics. Is there any relationship between standards of living and education? Can you propose some solution to the problem? Include pictorial or diagramatic illustrations in your work. Compile a book of all the reports done in your class and keep it in the room or in the library for a reference.

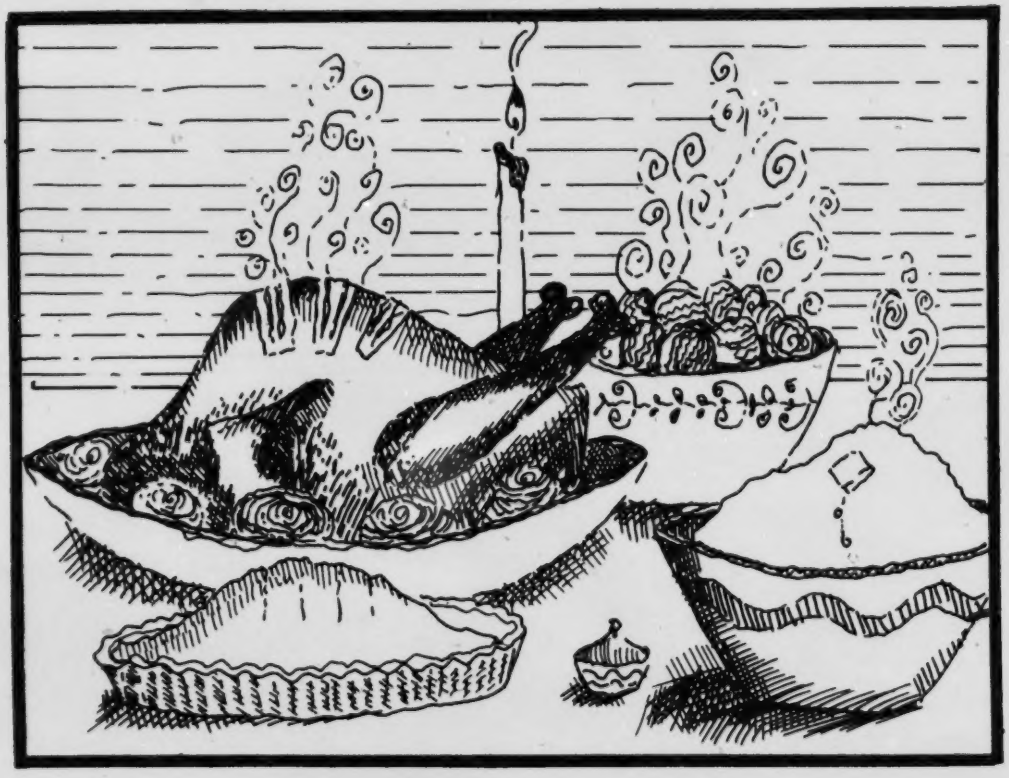
3. Do some research to find out the relationship between malnutrition and brain damage. In a child the brain achieves 80% of its adult weight by age three. What happens to brain development when the diet is inadequate in proteins or other nutrients? Can this lack be remedied when the child grows up? Report your findings to your class. There are many references you can use. One in particular is "Nutrition and Mental Functions," edited by George Servan, Plenum Publishing Company, New York. This book provides insights into the relationship between nutrition and mental development.

4. Some people who live in underdeveloped nations - people who are poor - and people who lack education concerning good diet may suffer from malnutrition and vitamin deficiencies. Serious illnesses resulting from poor diet are scurvy, rickets, pellagra, beriberi, endemic goiter and Kwashiorkor. Select one of these diseases and do some research on it. What are the causes? If it is vitamin related, name the vitamin. What are the effects? Are they permanent? Are there cures? State them. In what countries is the disease prevelant? What age is primarily concerned, etc.

5. In an article "Malnutrition and Infection," by Gerald T. Keusch in Natural History Magazine, November 1975, the author says that in the developing countries, many people, especially children, suffer from malnutrition

and infectious diseases. A simplistic solution is to get food to them, but intervention is neither simple to devise nor simple to implement. The problem is rooted in the social, cultural, political and economic morass of national development policies, and in the international relationship of nations. Explain. You may wish to choose one part on which to work, rather than the whole statement.

6. To be well nourished implies that one has a balance of certain kinds of foods in sufficient quantities. Discuss the calories needed for health in various age groups including yours. The ages might be infants, young children, teen agers, parents or senior citizens. Why do they vary? Plan a well balanced diet with the appropriate number of calories for two or three days for your age group. Put your diet to the acid test and see if you could live on it for several days.



OBJECTIVE: Relate food production and environmental degradation.

PROBLEM AREA: Pollution

GRADE LEVEL: 7-12

SUBJECT: Science, Chemistry, Health, Home Economics, Social Studies, Language Arts, Mathematics

ACTIVITIES:

1. Divide the class into groups of three or four. These groups should then, taking jars, travel to a local pond or stream, trying to get a sample with some bottom ooze. Using a microscope, each group should then identify the organisms living in their water sample (e.g., protozoa, hydra, rotifers, nematodes, diptera, and copepod.) If any of these are present, the group should divide their water sample into two parts. Into one, they should add a bit of garden fertilizer. They should then examine under the microscope and with the naked eye the contents of both jars to see if the fertilizer affected the number of organisms. What were the results? What conclusions might be drawn about the cumulative effects of run-off of fertilizer into streams and ponds? Is it good or bad? What can be done about this?

2. The hazards to health of offshore dumping include release of dangerous bacteria and viruses into the ocean and the introduction of pesticides and other dangerous elements into the food chain. You can trace the process of "biological magnification" in organisms using heavy metals as an example. Certain elements, called heavy metals, are normally present in low concentrations in the ocean (see table below). Shellfish and other marine organisms have the ability to concentrate these metals in their tissues. The following table provides some examples of the magnitude of this concentration.

Element	Normal Concentration (Micrograms/liter)	Enrichment Factors Oyster	Mussel
Copper	3	13,700	3,000
Cadmium	0.11	318,000	100,000
Lead	0.03	3,000	4,000

Have your students calculate the concentrations of these elements in the oysters and mussels. Consult the Food and Drug Administration to determine the maximum amount of Copper, Cadmium and Lead allowed in the food we eat. In certain polluted areas the concentration of these heavy metals can be greater by a factor of

ten than those provided by the table. Discuss the implications of this data with your students.

3. A spaceship from Mars lands in your backyard and out hop two goggle-eyed creatures. This is their tenth trip to Earth and they are dismayed and alarmed at the pollution the Earthlings create by their agricultural methods and food processing plants. Write an imaginary scene with the Mars Men investigating the problem and the solution they propose. Do they hold you hostage until the proper steps are taken by the United States Government?

4. One of the real concerns about environmental pollution is the destruction of the ozone layer of the atmosphere. Do some reading on this and have a class discussion. Decide on a way of making people more conscious of the problem. You might try a poster or comic strip. Discuss causes and effects. Get as wide a coverage for your work as possible.

5. Imagine that you are a newspaper writer. Your editor has given you an assignment to do a story on pollution of the oceans and its effects on food from the sea. Before you write you should do some research on oil drilling in the sea, the super tankers, coastal pollution, ocean dumping of sewage, heavy minerals and chemicals discharged into the sea, etc. Also, read some well-written newspaper articles and follow their style. Illustrate your article with photographs.

6. Discuss how the evolution of human societies has succeeded in isolating individuals from the importance of the food chain for human populations. Also discuss the implications of this isolation in terms of such practices as pesticide spraying, habitat destruction and monoculture. What remedies would you recommend for individuals and governments to reawaken human awareness of the natural environment?

7. Discuss some ways of getting more food from the land:

    1. Pest control
    2. Fertilizer
    3. Irrigation
    4. Machines
    5. New plants, etc.

    Divide the class into committees to study each way. Investigate pro's and con's. Is it possible to get more food without pollution of some kind? Report to the class and decide, if you can, which methods are best and why.

OBJECTIVE: Explain how technology has altered the production and procurement of food with attendant alteration of the environment.

PROBLEM AREA: Technology

GRADE LEVEL: 7-12

SUBJECT: Health, Science, Social Studies, Language Arts, Chemistry, Home Economics, Art, Careers

ACTIVITIES:

1. interplanetary travel of long duration and the possibility of space colonies call for increased technological methods of food procurement. Over the next two decades an increasing fraction of the several billion dollars that the United States and the Soviet Union will spend every year for space travel is going to be channeled into life supporting systems. Food from algae, the harnessing of photosynthesis, the fabrication of food and its integration into the recycling of oxygen, water and excreta are all possibilities. Do some research on these possibilities. What are their implications for people on earth? Discuss your findings with your class.

2. Name 20 food products which technology has made possible over the last two or three decades, such as dehydrated vegetables, color-added oranges, Wheaties, Hamburger Helper, etc.

3. Write an essay from the point of view of a poor but prominent member of a tribal society in an underdeveloped South American, African or Asian country. Comment on the introduction of technological inventions into your society. Criteria for successful accomplishment are inclusion of negative effects on the natural resource market, tribal moves and customs and lifestyle changes. Positive effects should include control of disease and improved standard of living.

4. Invite the Chemistry teacher to speak to the class about the nature of various chemicals normally found in foods for preservation, coloration, flavoring purposes. Are they usually beneficial or harmful to us? Are they able to be dispensed without bad effect on the food? Why must food be colored, or flavored with chemicals? What relationship does this have with the way food is transported, or the takeover by the food industries, and the closeout of the small farmer? (A smaller and

firmer hybrid tomato has been bred which is easier to harvest, being less soft, but which is less tasty. They are still too soft to harvest in quantities desired by the large industry which developed them, and so they are being harvested green and being treated with a chemical which turns them red.)

5. Students will prepare a public service announcement (for radio or TV) which advises the public to read the label of the food they are buying, to listen when they can and take note of new findings about the foods they buy, become more aware of the food products they ingest. Students will script the announcements, working in small groups of three or four, and if desired, draw a story board illustrating the idea. Labor may be divided according to talent, or split on each step of the project.

6. Using the comic strip way of portraying information, show five or six ways in which technology has affected the production and processing of various foods (spraying plants for better yield, the production of new synthetic foods, flash freezing or drying, quick process foods, etc.) Display your work.

7. The aim of food preserving and processing is to kill or retard the growth of bacteria. Investigate some means of preserving and bring in samples from home including (1) drying (raisins and apricots); (2) dehydration (powdered milk, instant potatoes, etc.); (3) freeze-drying (instant coffee); (4) canning (canned corn, peas, etc.); (5) freezing (frozen peas, ice cream); (6) irradiation (canned bacon). Portray your results in some artistic way--collage, mural, etc.

8. Using the hypothesis that, with the world's food problems, and an increased population, a new food stuff has been created from micro-organisms from the ocean. Decide how such a food would look and taste. Write and illustrate a magazine article or magazine ad for it. Include such considerations as texture, shape it would take, flavor, (would it be artificially flavored?), packaging, recipes for its use, (would it have to be combined with other foods to be palatable, etc.)

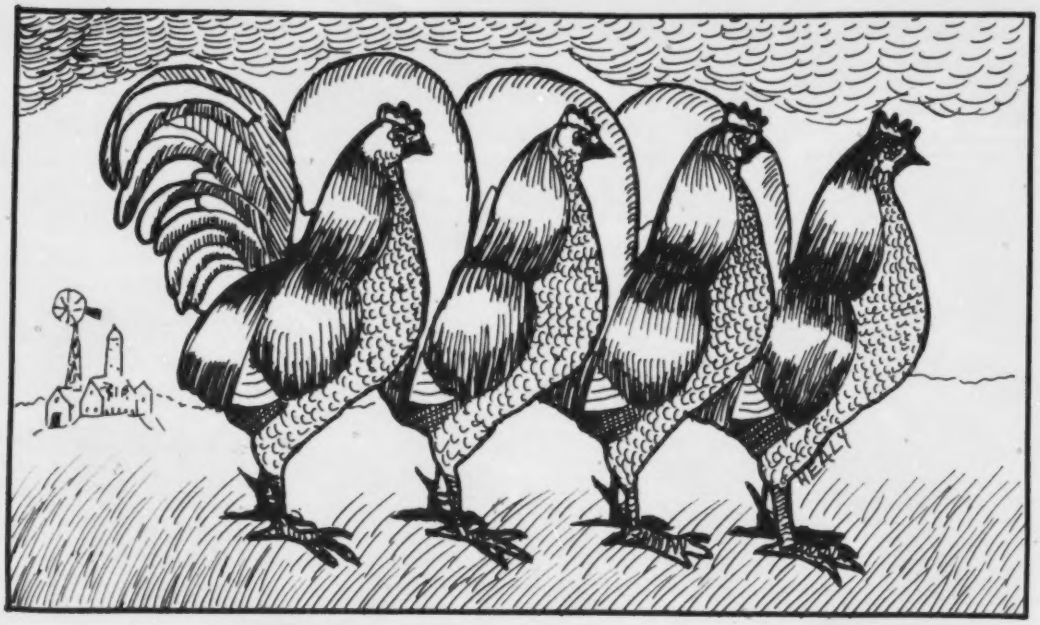
9. Algae is reported to be about 100 times more efficient than corn in the use of solar energy. Could we make use of this green plant which grows in such abundance in the sea? Write a report on this plant and its possible uses to man.

10. Imagine you are a hobo riding the rails of a freight train. Write your story. You are hungry as you crouch under the car as it hurtles over the tracks. You dream of food inside the freight and refrigerator cars. Make the story an exciting one.

11. Divide a piece of paper into two parts. On one side write five statements showing technological gains in food procurement and/or processing. On the other side write five statements explaining the drawbacks of the technology. Statements should be concise and correct.

12. Do some research showing how our continued use of some strains of wheat, corn, rye, etc. may be depleting our genetic banks of wild plants. Make a report to your class. You may wish to illustrate it with photographs you have taken or collected.

13. Research a career in the food industry (farmer, truck driver, shipper, irrigation engineer, county agricultural agent, biologist, chemist, etc.) Include training requirements, attributes necessary to bring to the job, what the job entails, rewards, advantages and disadvantages. If several people in the class decide to work on this activity, the results can be kept in a career notebook in the classroom or library.



OBJECTIVE: Investigate labelling and other aids to the consumer.

PROBLEM AREA: Labelling

GRADE LEVEL: K-6

GRADE LEVEL: K-3

SUBJECT: Language Arts, Reading, Social Studies, Art, Health, Economics

ACTIVITIES:

1. Ask your parents if you can accompany them when they shop for food at the supermarket. While they are shopping, walk around the store and find and make a list of 20 food items which are "store" brands (i.e., packaged with the supermarket's name). Then, find the same foods which are "name" brands and compare amounts, weights and prices. Which items are better buys, the "store" brands or the "name" brands? Give your list to your parents to help them in choosing brands.

2. Bring in to class a label from a can of your favorite fruit or vegetable. Copy the label on a piece of drawing paper. How many things can you find out about the food by reading the label?

3. Make a class or individual collection of labels. Then, on the blackboard, or on a large piece of paper, list them under such headings as: fruits, vegetables, etc. Perhaps you can list them in alphabetical order. Select other information to list: price, vitamin content, nutrients, brand names, etc. Have the list displayed so parents can see it when they visit.

4. Go food shopping with your parents, or on your own. Examine the labels on the canned and frozen vegetables and fruits for the contents of the packages, where they came from and the company that produced, packaged and distributed them. Make an informal list of these observations for discussion in class. Some of the kinds of observations might include: the proportion of foods containing preservatives, flavor enhancers, artificial coloring, etc. Students might do some research on chemical additives to discover exactly what they are in any of a number of consumer manuals. How many of the foods have family names on them? (Probably not many - the smaller family farmers cannot compete with the immense food producers.) What does this suggest about the size of farms in America compared to 20 years ago? Variations on this activity

might be: students will each choose one type of food, e.g., string beans, lettuce, baked beans, honey, flour, etc. and compile the above information for all available brands.

5. Collect as many labels of cereal boxes as you can. Compare them to see which cereals have the most protein, vitamins and minerals. Which are the best ones for you to eat? Act on your findings.

6. Draw a picture of someone in a supermarket or grocery store reading the label on a package or a can of food. Explain why the person is doing that. Hang the picture on your refrigerator at home.

7. Give three good reasons why it is important to read the labels of foods before you buy them. Make a comic strip illustrating the reasons.

GRADE LEVEL: 4-6

SUBJECT: Art, Language Arts, Social Studies, Health, Mathematics

ACTIVITIES:

1. Design a label for a canned food product which will tell something about its nutritive value. Things to keep in mind: the illustration should depict something that is appetizing, the colors should be attractive, and suitable, the type choice suitable, and the contents listed and realistic. A way for students to become familiar with current trends in advertising is to go through such magazines as Woman's Day, Ladies Home Journal, Family Circle, Better Homes and Gardens, etc., and look to see how the food ads get their point across.

2. Discuss the work of the Consumer Protection Agency and the ways in which the buyer is aided and informed. Bring in labels from cans and food packages. Check the information given - weight, ingredients, unit price, nutritional aspects, etc. Perhaps you would consider writing a bulletin for your parents on the Consumer Protection Agency.

3. Invent your own soft drink which is really delicious and nutritious and does not contain any chemical additives. Plan a label and design a container for it which will be so appealing everyone will want to buy it. Can the container be a recyclable one? Show your design to the class.

4. Design a package for a type of food. First, sketch the package out on scrap or newsprint. Design the package with the following considerations in mind: is the package strong enough to protect the food in transit and to preserve its freshness, yet not "overbuilt?" (A package that is "overbuilt" contains many wasteful features, i. e., extra wrapping, container within containers, unsuitable material for the size and shape, etc.) Does the manufacture of the package deplete a natural resource unnecessarily? Is there a comparable or better substitute for the depleted resource? Is the type used suitable? Is the depiction of the food inside accurate, are the colors true? Is the package easy to open? Etc. Following the design of the package on paper, construct the package by copying the design - in other words, make up a "dummy." Dummies may be made from cardboard, oaktag, construction paper, papier mache, or whatever else adapts itself to the designs. Dummies may be colored with a magic marker, tempera, crayon, water colors, pencil, etc.

5. Name four types of information which you can learn about a product by reading the label.

6. Tell why it is more necessary to label foods now than it was twenty years ago.

7. Request that the students bring to class labels representing food they have eaten in one day. On the blackboard have the students list by category substances they see contained in the various foods. Things they should notice include: the prevalence of cereal fillers, whether or not the cereal source is specified, how many contain meat, what is the source of the meat (is it possible to tell from the label? How many contain fish? Is the type of fish named? How many contain vitamin and mineral enrichment? Are they designated as being from natural or "synthethized" sources? Students should discuss just how what the ordinary person thinks they are buying compares to the actual contents of the container.

8. Take a hard word from our nutritional vocatulary, like "riboflavin" or "metabolism," or "Protein," and make up a new word. The new word should have some hint in the way it sounds or in the way it is spelled so that people hearing it or seeing it will know what it means, or might be able to guess what it means. Everyone should present his new word to the class to see if the class knows what it means or refers to. How could it be used in an advertisement?

OBJECTIVE: Relate food production and processing to energy use.

PROBLEM AREA: Energy

GRADE LEVEL: 7-12

SUBJECT: Social Studies, Science, Economics, Chemistry, Photography, Art

ACTIVITIES:

1. Read the book called "The Limits to Growth," by Donella H. Meadows, et al., Universe Books, N. Y., N. Y. Paperback, $2.75. The authors explore the relationship between food, energy, industrial development, population and natural resources in a very readable way. Write a report on the book. Include some of the graphs. Leave it in a place where other students can read it.

2. Do some research on the relationship between energy and the world food situation (oil prices jumped from $1.80 a barrel in 1971 to $11.65 in 1974). What happens to the farmer in a mechanized country, such as the United States? How about the costs of transporting and processing foods? What is the effect on prices? If mechanized countries cut back production, what happens to food surplus which is stockpiled for need in underdeveloped countries? Include graphs in your report.

3. Brain-storm an imaginary food made strictly by technology using chemicals only. Compute the cost for research, materials, payment for professional people, for the energy used to produce the food in comparison with conventional food, such as spinach or rice. Additional costs could be packaging, transportation, advertising, selling.

4. Discuss the huge upsurge of the fast food industry in recent years. Some of the things that could come out of the discussion should include the types of places, and the number of varieties, the value as a convenient way to eat, the nutritional value of the types of food served, the dependence of these places on the automobile, the use of paper and plastic products, energy using devices, etc. Arrange with a local fast food place to take an early morning field trip there and have the owner explain how they can serve food so fast. Particular attention should be paid to the energy-using equipment, the store's use of

refrigeration devices, power appliances, cooking equipment, etc. Some of the questions that might be posed for the owner to answer might be--would a gas shortage influence his business, what problems does he face, what does he do about waste disposal. A follow-up discussion by the class might take into consideration the future of the fast food industry. Will it continue to increase at the rate it has shown in the last few years? What are the predictions based on?

5. In an effort to break away from the "establishment" some people are trying to live on farms and in communes. What are their strong and weak points? Compare their methods of farming and life styles to the farm life of yesterday. Are they large or small energy users? Explain your answer.

6. Read the article, "One Day on a Kansas Farm," by Stephen Singular in Reader's Digest, April 1976. Discuss it with your class. How has the life of the Lindbloom's changed since they bought a farm of 107 acres in 1939 for $4500, and now, when they own a spread of over 7,000 acres. Their annual operating expenses are $150,000, all borrowed. Their income is $250,000 minus taxes and expenses. What kind of machinery and energy is needed to run this kind of farm? How much has the land value increased? Has the life style of the farmer changed? Do you think you would like to run this kind of business? Why or why not?

7. Identify areas of concern regarding oceanic resources. When the list has been compiled and displayed on the blackboard, choose one topic for research. Some of the topics that might come up include: off-shore drilling, two hundred mile fishing limit, whaling, off-shore production of gas, mining for minerals, ocean tankers and freighters as cheap mode of transportation. Attempt to compile information on the conflicting attitudes between developed and developing countries. What are the causes for this conflict? Which position do you support? Why? Perhaps as follow-up a debate could be arranged taking as issue the question of whether or not the use of oceanic resources should be attempted by private corporations, national governments, or some other agency? How important is the preservation of oceanic resources for the future generations of mankind?

8. Discuss recent developments in food production and preparation which involve increased energy use. Some of the developments that could be mentioned include: increase in use of frozen foods, freeze dried foods, boil-in-the-bag items, snack foods, single portion products, frozen dinners, etc. Some of the changes in production patterns that could come out in the discussion include: use of artificial light to raise fowl, enormous feed lots, industrialized farms, use of chemical sprays to speed maturity in plants and other topics the students have read about.

9. Tell why it is possible for a farmer in 1967 to supply 53 people with food, while in 1850 one farmer could only feed 4 people. Write your explanation or report orally.

10. Formulate five questions having to do with agriculture and energy use. Write a brief answer to each.

11. Collect or draw as many pictures as you can of energy consuming devices used to produce and process foods. (Tractors, trucks, corn pickers, potato diggers, special planters, etc.) Paste each picture on a page of a scrap book. Name the device and briefly explain its function. Present the book to a first, second or third grade.

12. Do a photographic essay on the different uses of energy used to produce or process foods. Things you might include: a farmer plowing, disc-harrowing, planting and/or harvesting his crops; getting his crops to market; the factory processing the foods, etc. Include an explanatory script and possibly a musical background. Present your essay to the school's parent organization.

OBJECTIVE: Suggest some solutions to alleviate world hunger.

PROBLEM AREA: Solutions

GRADE LEVEL: 7-9

SUBJECT: Language Arts, Home Economics, Health, Art, Biology, Social Studies, Chemistry, Art, Photography, Music

ACTIVITIES:

1. Someone suggested an imaginative solution to the food, energy, pollution and other problems of our day. The solution was that we should breed smaller people. If everyone were only three feet tall, think of the savings. Write a scenario depicting this situation. Relate it particularly to food production and its attendant problems. (Afterthought - what would happen to basketball?)

2. Select a solution for food shortages to investigate. Some of the possibilities are: (1) stockpiling, (2) Green Revolution, (3) aquaculture, (4) technological advance, (5) population control, (6) imaginative solutions, etc. Report to the class.

3. The comic strip "Little Abner" had a character, or cast of characters, called "Schmoos." These animals were so anxious to be of service to mankind and only wished to be eaten. They would assume the appearance and flavor of any food, and propagated prodigiously. They were a fantasy solution to the world's food problems. Invent a fantasy solution of your own to the world's food problems. Do a comic strip to depict it.

4. There are several suggested solutions to world hunger. Select one such as stockpiling and illustrate it in any way you wish.

5. If we were forced to eat a "no meat" diet our current production capacity would feed four to five times as many people as it now does. Feeding animals to furnish us with meat is less efficient than direct use of crops for food. Discuss what the repercussions of a meatless diet would be. How good is meat for man? Can he live well without it? What other sources of protein would he be forced to rely on? If we gave up meat would it actually help the starving people of the world?

6. Do some research on one of the new foods, "Ricetein," or a new grain called "Triticale," or any other new food you may know about. Why was the new food developed? Where? By whom? How costly is it? What are its advantages? Disadvantages? Share the information with others in your class.

7. Do some research on UNESCO, FAO (Food and Agricultural Organization, AID (Agency for International Development), WFP (World Food Program), HOPE, CARE, and/or other agencies. Select one to study, or do a comparative study. How do these agencies relate to the solution of food problems? Do their functions overlap or do they supplement each other? How do these agencies help to solve food shortages?

8. One of the most encouraging things in the world today is that many people are working together to help each other. It should give you a good feeling to know that people can cooperate to solve problems. Try to express that feeling using one of the media--you might record an original poem or story, work on a photographic essay, do a school assembly program, create a work of art, or a song.

9. The motto of the Food and Agricultural Organization (FAO) is "Let There Be Bread." What activities of the FAO enable it to fulfill the role which this motto implies? Would the distribution of bread to all hungry people in the world be an adequate solution to the problem of world hunger? Criteria: activities and explanation should reflect FAO's attempt to distribute food to the needy and, in particular, protein rich food to supplement nutrition poor diets.

10. List five solutions to world food shortages. Explain each in one clear, concise and factually correct sentence.

OBJECTIVE: Relate dietary practices to selected ethnic, religious, geographic and/or age groups.

PROBLEM AREA: Food customs

GRADE LEVEL: 4-12

GRADE LEVEL: 4-6

SUBJECT: Social Studies, Art, Language Arts

ACTIVITIES:

1. Have a luncheon or party where the food represents a national or ethnic group. Perhaps your mothers will help you. The dishes should be described. What group group does the food represent? What are the ingredients? Is the food eaten during a special time of the year or at a festival? Write up a program that tells about the food to be distributed at the luncheon. How about some ethnic music?

2. Iilustrate an ethnic food custom of a foreign country. Include the clothes the people of the country wear, the preparation or eating of the food, and some of the background information; i.e., food might be shown growing, details of the houses might be drawn, etc.

3. Select a food proverb and illustrate it. If you can't find one by asking your parents or doing some research here are a few to select from:

   Fasting doesn't kill, but gluttony does (Russian)
   Onions and a steam bath can cure any illness (German)
   Long meals mean a short life, short meals mean a long life (Italian)
   Enough is as good as a feast (English)
   A slender diet chases illness (Arab)
   Light meals ensure a long life (Scottish)
   Give green fruit and unshaven men a wide berth (Spanish)
   A dinner without fruit is like a party without music (Arab)

4. Choose a dish that you regard as "typically" American, and trace its ancestry back. Then, using what you have found out about the dish, design a poster incorporating the following elements: a basic recipe for making the dish, an illustration of the dish (this you may cut out or draw yourself), some copy describing the historical background of the dish, with the ingredients that were used

originally and those that are used today, the kinds of people that would eat this particular dish. As a follow-up, and if the teacher agrees, you may prepare this dish at home and bring it in for the class to sample. (One day might be set aside for everyone to bring in their dish.)

5. In old magazines find pictures of different kinds of people - starving person, a Masai of Africa, a Guatemalan child, an American child, etc. Select one. Paste it on a paper. Do some research on the nutritional aspects of the person. Where does he live? What does he eat? Explain the statement "You are what you eat."

6. Design on paper, (or by carving from wood or wax) an eating utensil. Try to make the design as functional and attractive as you can. If the school has casting facilities, make it in the scale you need to fit the crucible.

7. What foreign countries did your parents or grandparents come from? Ask your mother if she has a recipe representing the food of that country. Carefully copy the recipe. In your classroom make a cookbook of these "ethnic" recipes. If you can reproduce it and give copies to your parents or perhaps sell it for a special fund. You might want to try one or two of the recipes.

GRADE LEVEL: 7-12

SUBJECT: Social Studies, Home Economics, English, Art

ACTIVITIES:

1. Ask your parents for one of their favorite recipes that is traditional in the family. If the family does not have one, the student could get one from a cookbook. Following a demonstration on the use of linoleum block print (or wood block, or pen and ink), each student will illustrate his recipe. Recipe and illustration may then be copied if the school office is available and permission is granted. (Photocopy, Xerox, ditto) Then the pages can be put together to form a cookbook. A follow-up discussion might include types of food consumed by certain nationalities, or residents of certain areas, etc. If the cooperation of the Home Economics teacher can be obtained, recipes might be tested and sampled.

2. Select a time in history and research what foods were eaten and how they were prepared. How do those times differ from ours in food procurement, preservation, additives, packaging, preparation and eating. (E.g., Colonial Americans might have shot a deer, dried the meat, used salt as an "additive" to help preserve it.

kept it in a crock, prepared it over a spit in the fireplace and eaten it using forks and knives much as we do.) Prepare a menu for a day, or a meal using food of those times. Nutritionally, how does it stack up? If possible, actually prepare and serve one of the foods to your family or classmates. You might read the Fox Fire books or the Williamsburg Cookbook. The latter is published by Holt, Rinehart and Winston, New York 1971.

3. Describe, after research, the table manners of three different countries, or three different periods in history. Do you think manners serve a purpose? Write a short thesis or essay on imaginary manners, in an imaginary country (or place). Try to keep the tone of the essay serious, but make the content as outrageous as you like. The title might read something like: "Proper Table Manners in the Duchy of Aborachimia."

4. Select an ethnic group which you know about. Defend its position with regard to its food choices, i.e., the Hebrew prohibition against eating pork, and the Indian restriction against beef, etc. You may defend your position orally to your teacher or classmates or in a written paper.

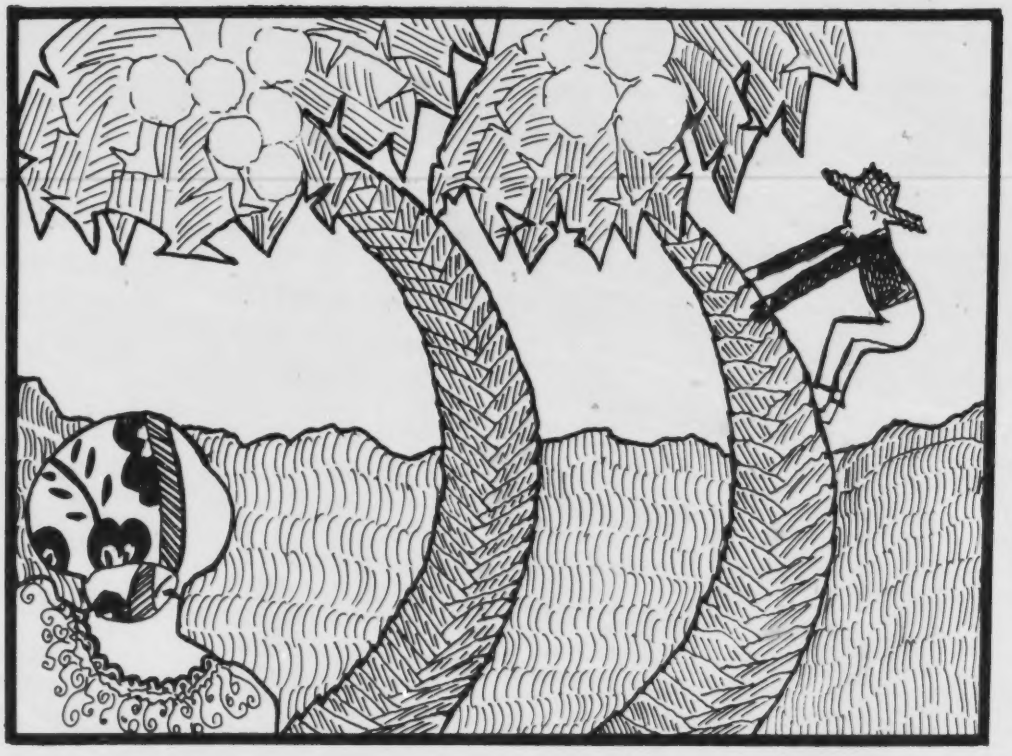
5. Discuss with the class why our culture uses so much meat in comparison with other cultures (e.g., Japanese, Indonesian, Chinese, Italian, etc.) Have the class research the incidence of heart disease in our culture as compared to some of the others chosen for study. Do we eat so much meat only because the United States is so wealthy a country, or are there cultural reasons, environmental, sociological? Would we be better off if we ate less? Is vegetable protein cheaper? How have cultures that rely on many kinds of vegetable proteins solved the problem of essential amino acids? What are some ethnic dishes that combine several types of vegetable protein? (Mexican, Chinese, Spanish cultures abound in good recipes combining vegetable proteins to make complete protein.)

6. Write a story or a play about a boy who comes to our country from Viet Nam, Ethiopia or some other foreign land. He is suddenly confronted with hot dogs, hamburgers, Dr. Pepper, soft, white bread, pizza and other strange foods which you mibht consider American "ethnic" foods. Portray his dismay and the homesick feeling he has for foods familiar to him.

7. Taking the premise that food serves functions beyond pure nourishment, and the consuming of food together is one of the activities which reinforce the social nature of man and enhances it, what has the popularity of television done to change the role of food in the social structure?

8. Tell five ways in which the search for and the acquisition of food has shaped our civilization. (Availability of food has dictated population growth, dietary taboos helped define religions; certain foods helped shape the study of medicine; when people farmed they left the nomadic tradition; the search for food has caused wars, expanded commerce, etc.)

9. Working with one of the foreign language groups of your school, and with the cooperation of the Home Economics department and/or the cafeteria, plan a meal of "tastes" of food representative of the country whose language is being studied. Why are those particular foods eaten? Are they related to holidays? Are they prepared in special ways? Find out as much as you can about the history of the foods.



OBJECTIVE: Analyze the relationship between food and economics.

PROBLEM AREA: Economics

GRADE LEVEL: 7-12

SUBJECT: Mathematics, Social Studies, Science, Art, Language Arts, Law, Careers

ACTIVITIES:

1. Do some research and find out the military expenditures of any ten countries you choose. Make a graph of the figures. One of the resolutions of the World Food Conference stated that government should reduce military spending and allocate a growing proportion of this money to finance food programs, particularly in developing countries. Make an arbitrary decision on what this proportion should be (i.e., 2% in 1980, 5% in 1985, 8% in 1990, etc.). You will have to decide if the percentage should be the same for all countries or should vary. Make a table using years along the vertical axis and percentages along the horizontal. Show how much money would accrue in each of the years for food programs.

2. Do some serious research on one phase of the food industry and its relationship to the economics of the country. You might select agriculture, farm implements such as tractors, mechanical pickers, etc., transportation, processing or advertising. Make some transparencies which can be shown to your class on the overhead projector. If you have no talent along that line, perhaps a friend in your class could help you. Present your findings to the class.

3. Illustrate some factors which cause food prices to go up or down. Think of such things as good weather, adequate water, soil above marginal, availability of fertilizers, energy for farm machines, transportation and processing, the laws of supply and demand, including trading with other countries. Display your illustrations.

4. Make up a list of fifteen items of food. Five of the items should be luxury things, five should be moderately costly, and five should be day-to-day easily obtainable, inexpensive food items. If students desire, they should be allowed to do field investigation, in the supermarket or delicatessen. After their lists are compiled, discuss which were the hardest to list. (It might not be the luxury items.) What are the reasons for the cost of each? Does it have to do with availability, or demand? What causes demand? Is it always utility?

Is it always scarcity? Can the two be controlled by the people who produce the items? Students should discuss which would be the most difficult and the easiest to market.

5. Research the food import and export business. How are food products transported in and out of a country. What laws exist to protect against the entry of harmful plants, animals and products into the United States? What part does the export/import industry play in the economics of a country? Report to your class on your research.

6. Describe, from your research and findings, the growth of markets, from friendly barter, to trading events, to the markets of today, on an international level. Are there correlations between the simple regulations and structures present in say, a medieval system, and those of today?

7. The USA does not grow coffee or tea, yet we consume a great deal of the world's supply (over 50% of the world's coffee). What soil, water and temperature requirements do coffee and tea plants have? What countries supply us with these products? Explain how the exportation and trading of these products aid the economy of the sending and receiving countries.

8. Research and investigate the issues in relation to enforcement of the 200 mile fishing limit. Divide into two groups or panels, one group taking the side permitting other countries to fish within the limit, and the other half of the class presenting arguments in favor of enforcing the 200 mile limit. The fishing limit dispute between Iceland and Britain might be used as an example. How does this issue affect the economics of a country?

9. More than 23 million people are employed in agri-business, 30% of our work force. Think about what these jobs are. Make a chart, diagram or pictorial representation (farmers, oil men, fertilizer manufacturer, truck drivers, surveyors, irrigation engineers, bankers, etc.) Show some of the jobs which employ this work force.

10. Obtain a copy of a local newspaper and turn to the classfied section. Identify those jobs which are directly related to the food industry. Select one that really interests you and find out as much as you can as though you were going to apply for the job. Inquire about the qualifications, the physical aspects, or job

description, salary, fringe benefits, hours and place of employment. List the advantages and disadvantages of the position.

11. Write a story of newspaper article on the plight of the migrant worker. Where does he come from? How does he live? What provisions are made for children going to school? How does his work contribute to the price of foods such as oranges, lettuce, grapes and/or other food items?

12. Do some research on food co-ops. Is there one near your school? If so, visit it. If not, perhaps there is someone among the faculty or in the parent group who has had some experience with co-ops. What is a co-op? Who starts them? How do they operate? Is food cheaper? Why? More nutritious? Why? Is there any way you might help in the formation of a co-op?

13. Most food stores put ads in newspapers with coupons for considerable savings. Look through the newspaper. If you took advantage of all the coupons how much would you save? (Discuss whether a bargain is something reasonable in price which you don't want in the first place.) Check the ads--what items would you buy? Calculate what you might save. Share your findings with your parents.

OBJECTIVE: Identify the roles of UNICEF (United Nations International Children's Fund), WHO (World Health Organization), FAO (Food and Agricultural Organization), FFHC (Freedom From Hunger Campaign) and other agencies involved in trying to alleviate world hunger.

PROBLEM AREA: Organizations

GRADE LEVEL: 4-6

SUBJECT: Mathematics, Social Studies, Art, Language Arts

ACTIVITIES:

1. In the library you will find reports of United Nations organizations whose purpose is to ameliorate the effects of malnutrition. The FAO (Food and Agricultural Organization) states that about 20% of the people in the underdeveloped countries are undernourished, and approximately 60% are malnourished. Make a graph of some of the statistics you find. Display your graph on your class bulletin board.

2. Make a diorama in a box showing how an international agency helps people. (For example, you might depict a teacher demonstrating new agricultural methods, or a doctor speaking about a balanced diet, etc.)

3. The United Nations has many committees and sub-committees related to the world food problem. Some of these committees are: UNESCO, FAO, FFHC, UNICEF, etc. Research these committees and their function. Plan a bulletin board or chart showing the functions of these organizations and committees.

4. Make a "box" movie showing what UNICEF is and what it does. This is the organization which is an arm of the United Nations and is devoted to helping children all over the world. American children collect money at Hallowe'en for this worthy cause. If you don't want to make a box movie, perhaps you can think of another way of portraying the work of UNICEF so that it can be shared.

5. Some private organizations which help people in other countries are CARE, Foster Parents, Red Cross, Salvation Army, etc. Select one to study. Report your findings to the class.

6. Design a seal for an international agency, either actual or imaginary, whose purpose is to help people through good food. Add a motto if you wish. The motto might be in a different language. Display your work.

7. A.I.D. (Agency for International Development, part of the United States Department of State) is concerned with helping other countries to provide better lives for their people. Find out exactly what A.I.D. does and what countries have benefited. Locate each of these countries on a map.

8. The Pan American Health Organization is the oldest international health organization. Make a map showing those countries in which it operates. Under the map leave a little space to tell briefly what kinds of help the P.A.H.O. supplies.

9. Make a large picture depicting the activities of a private or governmental agency. Show how the organization helps people. Perhaps you can include a map. If your picture is really a good one and reflects the things you studied perhaps you would like to send it to the organization. Many are located at the United Nations in New York.

10. Describe three activities of the World Health Organization (WHO), the Food and Agricultural Organization (FAO) and the United Nations International Children's Fund (UNICEF) which typify their roles in attempting to solve the world's food problems.

11. Select any three agencies committed to solving world food problems (UNESCO, AID, FAO, etc.) Explain the function of each briefly and concisely in a few sentences to a classmate or to your teacher.

12. Match the organizations on the left with their goals for alleviating world hunger.

1. FAO	a.	to supply food, medicine and clothing to needy children
2. UNICEF	b.	to help teachers and agricultural workers with fellowships for tools, seeds, study, etc.
3. WHO	c.	to provide information leading to improved world health.
4. FFHC	d.	to help the world's population to get more and better food.

(Answers: 1-d, 2-a, 3-c, 4-b)

OBJECTIVE: Describe the implications and outcomes of the World Food Conference held in Rome.

PROBLEM AREA: World Food Conference

GRADE LEVEL: 7-9

SUBJECTS: Language Arts, Foreign Languages, Social Studies, Health, Art, Music

ACTIVITIES:

1. U. S. Secretary of State Henry Kissinger's opening remarks at the World Food Conference stated that, "All governments should accept the removal of the scourge of hunger and malnutrition as the objective of the international community as a whole and accept the goal that within a decade no child will go to bed hungry, that no family will fear for its next day's bread, and that no human being's future and capacities will be stunted by malnutrition." Have a formal debate as to whether or not you believe this goal to be feasible. If a debate is not possible, argue for your position. Marshal your facts on food production, population, distribution of food, etc.

2. Go to the library and do some research on the first World Food Conference held in Rome on November 5-16, 1974. Who called the Conference? Who attended? What was its purpose? What agreements were made? Write a report on your research. Conclude your report with a paragraph telling whether or not you believe the Conference to be successful. Present your report to the class.

3. Write a motto for the World Food Conference. Study the aim of the Conference before you begin. Perhaps your motto could be in Latin, French, or some other foreign language. Illustrate it if you are so inclined.

4. Imagine that you are a reporter for a large city newspaper attending the World Food Conference. Write a series of articles on the Conference. One article might be on the people who attended and the politics which sparked differences of opinion. Another might be on the aims of the Conference, while a third might concern itself with outcomes. These are merely suggestions. You might choose other topics. If possible type your news articles, display them on the bulletin board or get them printed in your school or local paper. The first rule a good newspaper reporter learns is that the lead sentence of his article should include four W's - Who, What, Where, When.

5. Form a committee of three to five people. Use a bulletin board to illustrate a pictorial or a schematic representing the World Food Conference. Make it as colorful and informative as possible. Can your bulletin board be placed in the school hallway where it can be seen by many people to acquaint them with the aims and outcomes?

6. The aim of the World Food Conference is an idealistic one. Just the fact that the Conference took place indicates care and concern for one's fellow man. Write a folk song or a ballad addressed to this concern. Perhaps you could accompany your ballad on a guitar. Teach your song to your classmates, or to some younger children.

7. A resolution of the World Food Conference called upon governments to reduce military expenditures and to allocate a growing proportion of these sums to finance food production in developing countries and establish reserves for emergency cases. Read the original statement from the Conference report. Discuss the possibility of this happening with your classmates. Which countries do you believe might be open to the idea? Why or why not? Is the basic idea a good one? What does it imply?

8. One of the resolutions approved by the World Food Conference was called, "Food and Women." It called on governments to involve women in making decisions on food production and nutrition policies, to promote equal rights and responsibilities for men and women, and to include education for women in various aspects of food production. Get a copy of the World Food Conference at your school or public library and do a report on this topic which might be written or pictorial.

9. Select a topic which the World Food Conference studied, (nutrition, irrigation, stockpiling, fertilizers, trade, pesticides, seed development, early warning systems of impending famine, etc.) Research the topic and find out as much as you can about it. Teach what you have learned to children in a younger class.

OBJECTIVE: Analyze the social and environmental implications of the Green Revolution.

PROBLEM AREA: Green Revolution

GRADE LEVEL: 7-12

SUBJECT: Language Arts, Social Studies, Home Economics, Nutrition, Health, Economics, Mathematics, Art

ACTIVITIES:

1. Debate the following: In Spite of Its Critics, the Green Revolution Has Proven Itself Beneficial to Mankind. Some of the pro's might be: added food for millions of people, cash crops for the first time for many farmers, independence from foreign food supplies, better nutrition for the first time in many countries, etc. Some of the con's might be: the Green Revolution calls for heavy fertilization and irrigation, the increased food supply has increased the population, farmers in undeveloped countries may not be ready for increased technology, etc.

2. Dr. Norman Borlaug made the Green Revolution possible with his experiments on grain crops and his development of super genetic strains which make extraordinarily large harvests possible. Do an illustrated biographical sketch of Dr. Borlaug. Include his views on the Green Revolution.

3. Imagine that you are suddenly sent to India as a member of the Peace Corps to help educate the people of a small village about the Green Revolution. Write up the story of your two-year stay. It could be in the form of a diary.

4. In an art form of one kind or another (watercolors, acrylics, block print, batik, etc.) illustrate the benefits of the Green Revolution.

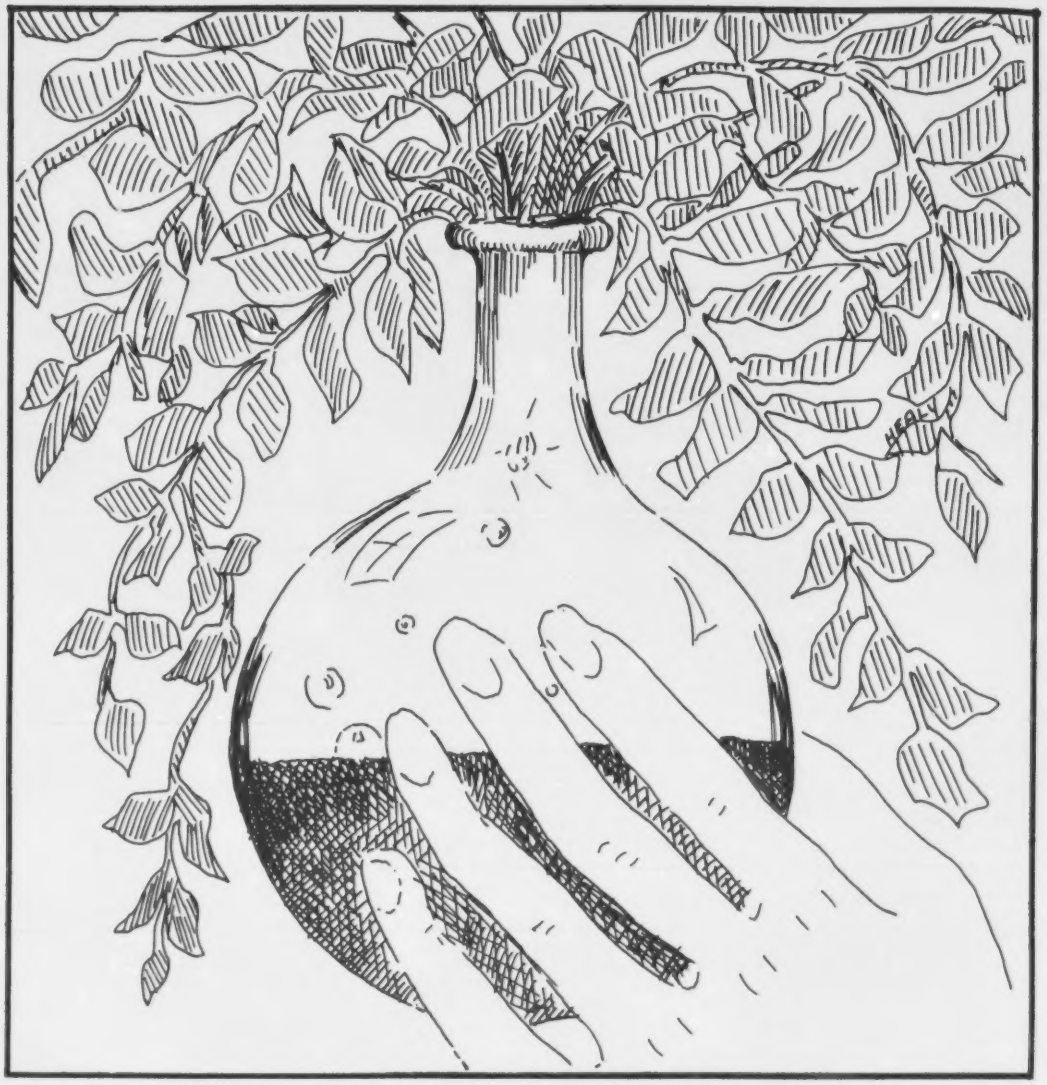
5. Get together with two or three friends and do some research on the Green Revolution. Include its social and environmental implications. Write up your findings in as fine and interesting a report as you can muster. You might want to include maps and graphs. Bind your report and present it to your library. You may wish to work alone.

6. List three benefits and three criticisms of the Green Revolution. Select one in each category to explain.

7. Define the Green Revolution in some kind of written form - a dramatic play, short story, poem which could be blank verse if you feel more comfortable in that

genre, a ballad, etc.

8. Read an article on the Green Revolution. Make an oral or written review of the article and present it to the class.



OBJECTIVE: Investigate the political aspects of food distribution.

PROBLEM AREA: Politics

GRADE LEVEL: 7-12

SUBJECT: Social Studies, Economics, Language Arts

ACTIVITIES:

1. According to Dan Paarlberg, Director of Agricultural Economics in the U. S. Dept. of Agriculture, there are four myths regarding food aid policies: (1) the triage strategy based on the notion that some countries are beyond help, (2) the protectionist myth or the idea that if we help poor countries to expand they will take away our markets, (3) the gratitude theory which is the notion that if we give freely to other countries, they will then vote with us at the United Nations, (4) the abstainist idea whose proponents believe that if we give up eating meat, it will help feed starving people in other countries. These theories are explained in the content section of this CBRU. Read about them. Perhaps you can find more information about each item. Have a panel discussion. Each panel member can choose one myth to explain. Be sure you can tell why it is a "myth."

2. After the First World War, Herbert Hoover who later became President of the United States, was in charge of aiding European countries to get back on their feet. Huge supplies of food were sent to Germany, France, Greece, etc. After the Second World War, the Marshall Plan went into effect to help European countries recover from the ravages of war. Investigate these plans. How did they work? Did they help? Were we aiding countries for altruistic reasons only? Tell the class of your findings.

3. Form a committee of students seriously interested in the question of the political aspects of food distribution. Research the topic. Give a report to the class. Perhaps your parent group would like to hear it.

4. As a class make a collection of newspaper and magazine articles concerning the political aspects of food distribution. Place them on the bulletin board or make a booklet for them for classroom use.

5. Make a list of the countries with which we trade. What kinds of things do we send them? What do we get back in return? Are the reasons we deal with these countries purely economic or do politics enter the picture. Explain.

6. Find a newspaper or magazine article related to food and its political implications. Read it and report to your class. Do you agree or disagree with the points made in the article. Explain why or why not.

7. Explain what trading of surplus commodities does to the price structure. For example, when we sell surplus grain to Russia, are the economic effects good or bad or both. Explain. Also explain the political effects.

8. Explain the "triage" strategy of dealing with world food problems. Describe what it is, where the term came from, and your opinion as to its possible use in the future.

9. "The fundamental question is a moral one....I would claim that we in the United States will not long be able to retain our humanity and decency...in a world where one-third of the human beings get too much to eat and two-thirds are starving," says Robert Revelle. React to the statement in some art form, song, poem, dance, painting, etc.

OBJECTIVE: Analyze the relationship between agriculture and land use.

PROBLEM AREA: Land use.

GRADE LEVEL: 4-12

GRADE LEVEL: 4-6

SUBJECT: Art, Social Studies, Music, Photography

ACTIVITIES:

1. Make a collection of pictures of land used to produce food. You might have pictures of terraced vineyards in Germany, Greek olive orchards, a wheat farm in Canada, a small vegetable farm in New Jersey, Japanese rice paddies, etc. Put the pictures in a book for younger children. Explain each in simple and clear language.

2. Imagine that you are an American farmer from the mid-West visiting a farm in Greece (or any other country). Compare methods of farming, historical use of the land, tools used, etc. Show how the style of farming depends somewhat on the size of the farm, and the feeling of the people for the land itself.

3. Try to find an abandoned farm on the outskirts of a city or large town. Take pictures of it. What can you find out about the old farm? How big was it? What crops were raised? Where was the house? Were there other buildings? Why was the farm abandoned? What happened to the farmer and his family? Perhaps the local historical society will be interested in your report.

4. On a map of your community, color in three areas which are recreational, residential, industrial, commercial and agricultural. On another map of your community, color in the same categories, but use data from 1920. Compare the two maps. How do they differ, particularly with regard to food growing, farms, the possibilities for gardens, etc.?

5. Folk music is a predominant art form. It is often used to express concern about social, environmental or political problems. Find out how the following people reflect their attitudes about the land in song. Play some of their records. Pete Seeger, Joan Baez, John Denver, Judy Collins. Perhaps you know others.

6. Secure an aerial map from the county land office (ask for it directly or through the Environmental Commission). Identify all areas that are used for agricultural purposes. Are there lands that are not being used, that would be amenable to being cultivated? Plan for the use of the lands, choosing crops that would be best according to soil type, slope, exposure, climate, ability to harvest, etc. Investigate the possibilities of using this plan.

7. Raise some vegetables on a piece of land you own or can borrow. Read the article "Vegetable Gardening: Double Your Yield," by E. H. Brindle in Reader's Digest, April 1976, for some good clues. Report to the class periodically on how your garden is coming. Photograph your results or bring in some actual results of your labors.

GRADE LEVEL: 7-12

SUBJECT: Social Studies, Language Arts, Mathematics

ACTIVITIES:

1. Compare the European or American Indian's feeling for the land as compared to the historic American whose idea has always been "Go West, young man" or "After this land is used up, there's plenty more somewhere else." The European, whose small pieces of land have been in his family and worked by his forebears for generations, has a very different feeling. So has the American Indian, who has traditionally had a great reverence for the land. Are land attitudes changing in the United States? Is land still exploited? Discuss these questions and others related to these ideas. Report your findings in a novel way -- song, art, photography.

2. The optimum size of a California vegetable farm is 440 acres; the average size of corporate farms which now dominate California is 3,206 acres. What can you say is happening to the small farm? What technological improvements have made large farms (Agribusiness) possible? Discuss some good and bad aspects of the small farms being merged into large ones.

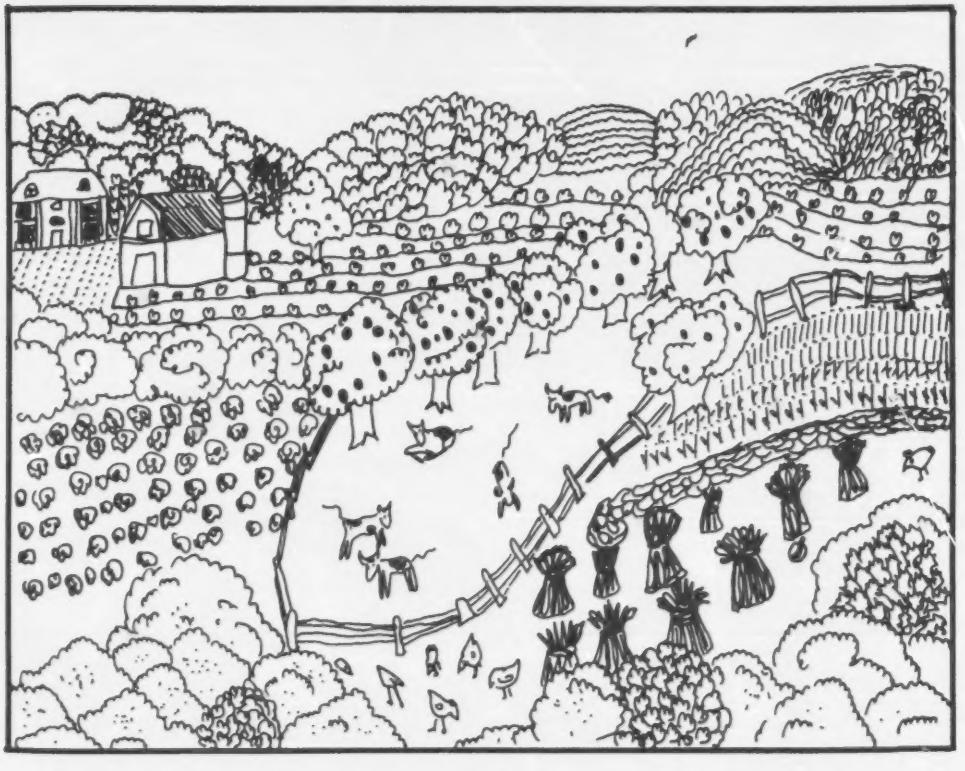
3. Explain why more marginal land cannot be used for agriculture. Item 149 in the content section of this CBRU will give you some ideas. Your explanation should be correct and you should be able to point out at least three countries in the world where marginal lands have already been exploited.

4. Imagine that you have been given the charter to your state and that it is quite empty of humans and all

their traces. You are free to develop the land any way you wish. Consider climate, topography, rivers, lakes and oceans, etc. Can you make the state self-sufficient? What areas would you use for food growing, and what foods would you raise? How many people would your state support? Where would they live? Would you trade with other states? What would you do with surplus food, if there were any? Draw a large map of your state on paper and try out your schemes.

5. A cow in tropical America devours tons of "poor" feed over a period of four years to get to the total weight of 800 pounds. A cow in Texas eats much less but grows to 1000 pounds in a year and a half. The cow bred in the United States provides 4,000-5,000 quarts of milk a year, while the cow from central America has only enough milk to feed its calf. Depict this information on a bar graph. Explain why this is so.

6. Suggest three solutions, original or researched, for ways to help small farmers retain their lands.



OBJECTIVE: Examine the impact of governmental regulations on the food industry and the consumer.

PROBLEM AREA: Government regulations

GRADE LEVEL: 7-12

SUBJECT: Social Studies, Law, Economics, English

ACTIVITIES:

1. Work out a diagram or a graphic interpretation showing in what areas the government regulates the food industry. For instance, you might draw a circle in the center of your paper, labelling it "The Growing of Food." Around it you might arrow in all the government rules which regulate food production, such as subsidies, price fixing, acreage limitation, etc. On the other hand, you might choose to do food additives or another aspected of how the government functions.

2. Meat is inspected by the Government. There are certain standards. Visit a meat packing plant, a butcher shop or the meat department of your local supermarket and talk to the meat man. What are the standards? Can you see the differences or merely taste them after the meat is prepared? Why is the law necessary? Under whose jurisdiction is it? What other laws have been passed regarding food and the consumer. (If you visit, do not forget a thank you note after you return to school.)

3. Bring in a label from one type of food, e.g., dried cereal, canned fruit, frozen dinner, etc. Discuss what information is usually contained on the label, e.g., calories, protein, carbohydrates, fat, and the percentage of U. S. Recommended Daily Allowances for protein, seven vitamins and minerals. When must food have nutrition labels? (Whenever nutrients are added - or for those foods which make nutritional claims.) Students will compare nutrition in relation to cost - and decide which of the brands is the best to buy.

4. List at least five governmental regulations which impact on the food industry and the consumer. They can be in any area - agriculture, additives, advertisements, etc.

5. Take a real or imaginary trip to a farm. What crops are raised? Where do they go? What are the nutrients needed for the growing of crops? How old is the farm? How does the produce differ from years ago? How does the farmer replenish the soil? How are the crops trans-

ported? What kinds of energy are used? What kind of local, state and national regulations are there? Discuss your findings in the class.

6. The government has many policies affecting the farmer. Some of these are: farm subsidies, price supports and direct payment benefits of the farm commodity programs, inducements for acreage limitation, etc. Research one or more of these programs and explain it/them to your class.

7. Write to the Department of Health, Education and Welfare, Public Health Service, Food and Drug Administration, Rockville, Maryland, 20852, for their weekly list of Food and Drug Administration Weekly Report of Seizures, Prosecutions, Injunctions, Field Corrections and Recalls. Post it on the bulletin board.

8. Visit a dairy or poultry farm. Ask what regulations are imposed on the farm by the state and national government. Discuss whether or not you think the regulations are good ones.

9. Make a collection of ads for vitamins and the claims which some companies make for specific ones. Then write a paragraph or two describing regulations about vitamins set up by the Food and Drug Administration. Put all your work into a booklet for a class or library reference.

10. Imagine you are a teacher who wants to check the knowledge of her class about government regulations of food. Write five or ten questions and try them out on your classmates.

OBJECTIVE: Identify factors causing worldwide concern about food.

PROBLEM AREA: Worldwide concern.

GRADE LEVEL: 7-12

SUBJECT: Social Studies, Language Arts, Mathematics, Art, Economics, Science

ACTIVITIES:

1. None of the basic resources required to expand food production are abundant today. The resources are land, water, energy and fertilizer. Select one. Draw a map of the world and show how the resource you have chosen is being used to good advantage today and what the prospects are for the future. For example, if you select land use, you should be able to show what land is being used, what land is marginal, and what land has very little prospect of being used.

2. Generally speaking, there are four major problems which are critical to the world food situation. 1. Grain stocks are very low and cannot be rebuilt until production increases. 2. High food prices make it possible for only developed countries to buy foods. 3. Fertilizer supplies are very low. 4. Chronic food deficient areas are affected more by high prices for food, fertilizer and energy. Select one to do some research on and report to your class. Perhaps everyone in the class could work on these problems in small committees. Then the reports could be made by groups instead of individuals.

3. Imagine that you are a delegate from one of the undeveloped countries to the United Nations. The concern of your government is food. Plan a speech to present to the UN stressing your concern, the past history of your government's ability to acquire food at reasonable prices from available stockpiles, the situation today when food is so expensive that richer countries are buying up food stocks (e.g., Russia from the USA) and some solutions which your government is formulating. Give your speech to your class.

4. Name three factors which are causing worldwide concern about food. Explain each in two or three clear and concise sentences.

5. Have a panel discussion on factors causing worldwide concern about food. You will need to do some research. After the panel is through, everyone in the class should react by selecting one factor causing concern and proposing a solution.

6. Imagine that you have just been appointed Artist-in-Residence by the Department of Agriculture in Washington. The Department is eager for you to do a wall mural on factors which are causing concern about food. Plan the mural on a large piece of paper. If you need help, ask some of your friends to work with you. One of the leading painters in Mexico, Diego Rivera, did some very powerful murals depicting the life of the Mexican people. You might copy his style. Hang your mural in the hallway of your school.

7. On a graph draw a curve which approximates the current rate of world population increase and a second curve approximating the rate of increase in food production. The population curve should be steep, reflecting exponential growth in population; food production increase should be shown by less steep curve reflecting arithmetic increase.

8. The increase in petroleum prices from $1.80 per barrel in 1971 to $11.65 in 1974 has had repercussions on the world food situation. What are some problems that have resulted from this new high cost of oil? How does it affect the farmer, the food transportation industry, and the production of fertilizer? Form class committees to investigate the many aspects of this problem.

9. An area of concern to many people is high food prices. Explain why, in all probability, we will never know cheap food prices again. Relate your answer to the cause and effect principle of energy use in food procurement and processing.

10. At one time it was believed that the oceans could supply many of our food needs. At this time, the thesis seems more unlikely. Construct two pie charts using the 1970 statistics for world fish consumption and for world population to demonstrate the disparity of fish consumption between developed and underdeveloped countries. The data you will need for fish consumption are: USSR and Eastern Europe 16%, Japan 15%, North America and Western Europe 23%, China 14%, Africa 6%, Asia and Oceania 22%, Latin America 4%. The figures for world population are: USSR and Eastern Europe 10%, Japan 3%, China 21%, Africa 9%, North America and Western Europe 16%, Asia and Oceania 33%, Latin America 8%. Explain your charts.

11. There are some countries where starvation exists and malnutrition is a fact of life. Discuss some of these

countries. Select one and do a report on it. Why does famine exist? What are the forms of malnutrition? Are the conditions man-induced, or are they climatic or geographic? Do religious and/or ethnic beliefs play a part? What is the relationship of shortages to population, natural resources and/or economics? (Would India have famine problems if they were oil rich?)

OBJECTIVE: Interpret how advertising creates demand and affects cost.

PROBLEM AREA: Advertising

GRADE LEVEL: K-12

GRADE LEVEL: K-3

SUBJECT: Language Arts, Reading, Health, Social Studies, Art, Economics, Mathematics

ACTIVITIES:

1. Divide a piece of paper into four parts. In the first section draw the picture of someone watching an ad for a food on the TV or hearing it on the radio. Second picture: show a person (maybe you) in a store buying the food. Picture three: preparing the food to eat. Picture four: your response. Was it good or not? Did you like it? Why or why not? Because an ad says something is good, does that make it good?

2. Look through a magazine with your mother or some member of your family. Read the food ads. Decides which ones are really truthful. Bring that/those in to show the teacher.

3. Tell about an advertisement you saw about food on the television or heard on the radio. What was the food's name? Why did the ad say you should eat it? Do you think the ad really told the truth?

4. Make a collection of food ads in newspapers and magazones. Paste them in a book. Practice reading from the book. You will learn lots of new words as well as facts about food. Can you believe all that the ads say or do you have to discredit some things?

5. After a discussion on advertisements in the classroom, the good things about them and the bad, report to your mother or whoever does the shopping at your house.

6. Get an advertisement of a food from a magazine or draw one that you have seen on TV. Next to it paste a label of that food. If there are differences, show them by underlining key words in red or by some other means. Write a sentence or two explaining the relationship between the ad and the label.

GRADE LEVEL: 4-6

SUBJECT: Language Arts, Reading, Social Studies, Economics, Health

ACTIVITIES:

1. Tell a story about someone who heard or read about a super-duper food that was supposed to make him do great things. Maybe even fly! The person rushed all over and with great difficulty found the food. He followed the directions exactly for preparing it--mixing it with a fan, blowing right on it so it would be very airy--then with great gusto he ate it. After three days, what happened? (Just as he was giving up hope!) It's true he flew, but to do so his shoulder blades grew 5 ft. and he couldn't fit into his clothes, etc. (Maybe he had to fly without any clothes on and think of all the embarrassment about that!) The ad never mentioned all those things. Our poor friend had to spend the next three years on a special diet to reduce his shoulder blades. Anyway, make up your own story. Maybe everyone can tell one sentence. Act out the story. Include some music.

2. Is there a relationship between advertising and labelling? Select a food you have seen advertised on TV or in a magazine. Check out the food according to the label. Is it all the advertisement said it was? Will this one food make you strong, beautiful, healthy, etc. as the ad promises? Are there things the ad doesn't say? Remeber the ad is written so that it makes you want the food. Does that make the food good for you?

3. Role play the part of settlers, meeting an intinerant peddler, and trading handicrafts, game, pelts, lodgings and food for the kinds of items the settler might need (dishes, pots, cutlery, fabric, news, etc.) How did the itinerant peddler advertise?

4. Make up a jingle to advertise a food you know and like. It could be for milk or apples or carrots. Write it, or have the teacher write it on the blackboard. Make a copy to take home to your mother. Will she believe the "advertisement" and buy the food?

5. Given two or three magazine ads for foods, student will chose one and indicate truthful and exagerated claims in the ad.

6. Ads always give us reasons why we should buy whatever the ad is about. Give four or five reasons you have heard as to why you should buy certain products. At least two must be food related.

7. Invent your own food item, for example, "Starries" cereal, shaped like the stars. Plan an advertising

campaign to sell your product. Create a jingle which might be sung on TV. Get some of your friends to help you sing it to the class. You will have to decide why "Starries" are worth buying, i.e., body-building, energy-producing, healthy, tasty, etc., etc.

GRADE LEVEL: 7-12

SUBJECT: Language Arts, Social Studies, Health, Mathematics, Economics

ACTIVITIES:

1. Student will design and execute an ad for a food product. Remembering the purpose of the ad is to make the reader want the product, the claims made for it can be quite preposterous. Criteria lies in the fact that the student knows that ads are often misleading.

2. Divide the class into groups of four or five, and have them formulate an advertising campaign "unselling" the audience on the acceptability of food additives to increase consumer acceptance of food products. The same methods that advertisers use to sell a product should be used to "unsell" the purchaser's acceptance of food additives. Implied by the ad should be that if the individual buys the dyed orange, the sprayed tomato, then she/he is not a good mother/father, socially attractive, with acceptable breath, with good blood (not tired), or even just plain smart. Choose for the subject of the ad campaign a product that has additives are used to either change the color or texture of food.

3. Research and describe the way television has affected the eating habits of people in America. Try and divide the approach you take to this topic to include both preparation and types of foods available and the actual consumption.

4. Discuss the ways in which we, in our culture, use food ritualistically or traditionally. The roots of these traditions should be examined. Examples that suggest themselves might include: turkey at Thanksgiving (mince pie, apple pie, pumpkin pie, sweet potatoes, cranberry sauce, etc.), wedding cake (why a cake and/or champagne?) eggs at Easter, etc. How are occasions or festivals celebrated differently in other cultures? Is food always a component of the celebration? Students, following research and discussions in class, will work cooperatively in formulating an advertising campaign in which a new food product is identified with an occasion that has a strong emotional content, and that is deeply entrenched in a social celebration. What kinds of psychological suggestions could be made to convince the public that a certain occa-

sion is not a special occasion without this special food. Has this ever been done? (Frank Perdue, a chicken producer, did have one TV ad trying to undermine the turkey-at-Thanksgiving tradition.)

5. Plan an advertising campaign for an unattractive product. Students can choose the product or take the teacher's selection. Select one of the following: liver-flavored crackers for snacks, lima bean yoghurt, spinach drink, crayfish condensed soup. Each group should try to concentrate on one aspect of a campaign such as: radio announcement, magazine ad, TV spot announcement, poster, story board (as explained by the teacher). Concentrate also on selling one aspect of a product--e.g., its nutritional benefits, how much "fun" the product is to eat/drink, the exclusiveness of a product, etc.

6. Attempt to discover the cost of putting a new product on the market. Information on advertising costs, research fees (to test the safety of the product), cost of manufacturing, etc. may be obtained through writing the company or through a copy of the annual report. What amount of the cost is used for safety testing compared to advertising. What do the results of this study show about the priorities of businesses? How does it help the individual to become a better consumer by understanding the process of marketing a new product? Has this activity changed your perspective about purchasing? How?

7. Name five ways in which advertisements persuade us to act in certain ways. At least one of the ways should be concerned about food.

OBJECTIVE: Examine the history of food from the earliest hunter-gatherers to the present.

PROBLEM AREA: History

GRADE LEVEL: 4-6

SUBJECT: Social Studies, Language Arts, Art, Manual Arts, Music, Photography

ACTIVITIES:

1. Select one period in the history of man and his food and write a play about it. You could portray early cave man, the Greeks, Romans, Dark Ages, Egyptians, Renaissance, American settlers or explorers. What foods were eaten? How were they procured? Was it a time of famine? Why? Give the play as an assembly program. Include music.

2. Look up some information on foods of the Middle Ages. What foods were grown? How were they harvested and prepared? Make a stained glass window of a scene related to your studies. Instead of stained glass you can use colored tissue paper and black construction paper. These are really beautiful when placed where the light can shine through them. Take some photographs of your work to share with other schools. Include some background music.

3. Write a play, poem or story about an abandoned farm or take some photographs. Try to visit one and soak up some of the feelings for the place. If you can't visit, look at some pictures. However, do not rely only on emotions, present some facts also. Work out a musical background for your effort. Present it at an assembly or other school program.

4. How are the foods people eat today different from the foods people ate 30 years ago? 100 years ago? How are the foods people eat today different from the foods people ate in 1776 at the time of the Revolution. Draw up 3 menus to show the different meals. How do they compare nutritionally? Are our present day meals superior to meals prepared and eaten in earlier times? Select a time, illustrate a menu of that time, include a paragraph or two, describing how the food was prepared and if it was nutritionally superior (or not) to our present diets. Display your work.

5. Research the story of the "Yankee Peddler," the role that this itinerant salesman filled for people isolated

in outlying regions of the new country. How did he affect the food preparing and eating habits of the people he visited? Write a ballad or song about the Yankee Peddler and accompany yourself on the guitar. Or write a poem or dramatic story about him.

6. Build a model of a Yankee Peddler wagon, and include in its contents the types of things he might have carried. Miniatures may be made up from things around the house, doll dishes, caps of bottles (as cooking pots), ribbons, patterned (as yard goods), can tops (as mirrors), etc. This model, along with a doll dressed as the peddler (or made from papier mache) may be set up as a display in hall windows. The Yankee Peddler wagon played such an interesting part in our country's history, perhaps you would like to do a play about it.

7. Divide into groups of four or five, and write a short radio drama that concerns food. An example might concern pre-historic man's first realizing that a particular item is a food source, and his finding a name for this food, (e.g., clams). Do some research first so that your facts are correct. When you've gotten the radio program written and cast, the group can perform it on a tape recorder borrowed from the audio visual department. Perhaps during homeroom the principal would permit your script to be broadcast over the school loudspeaker, if the program could be kept to the right length.

8. In the historical development of the farm it is now apparent that farms are growing in size and that a new venture called Agribusiness is emerging. Debate the proposition: Agribusiness is a Better Way Than Small Farms. Argue the effects of agribusiness vs. small farms on energy use, pollution, price fixing, more food produced, social effects. etc.

9. Prepare a taped interview with two or three long-time residents of the area in which you live. Questions might include: 1. How long have you lived in this area? 2. How does the present use of the land differ from the way in which it was used when you first came to the area. 3. If use has changed, ask why do you think it is no longer used in the same way? 4. What is your opinion on the present use of the land? 5. Did you, or anyone you knew/know now work in agriculture? 6. Did they/you change occupations? Why? Some of the information that might come to light in the interview are: 1. The rising value of land due to

use for residences rather than for farming. 2. Changes in the drainage due to encroaching residential use. 3. The decline in water used for agriculture, and greater use by industry, and by the new population. 4. Pollution and contamination affecting agriculture too near residential and industrial areas. Students, if they like, could take slides of the present area, and slides of old photographs, maps, etc., for effective juxtaposition in the slide show. The show, along with the taped interviews, could be presented to other classes.

10. Develop a mural showing the progression of farming from its earliest inception to the present time. Show how early man had only sticks to help him, then how the steel plow aided man and was replaced by the tractor, etc.

11. Select a food with at least five ingredients, (cake a casserole, stew, soup, etc.). Give the history of as many ingredients as you can.

12. Make a time line showing the following in proper sequence. Prehistoric man at first a meat eater. Man changed to a food producer at the end of the ice age, about 8,000 BC. Agriculture first developed about 10,000 years ago. Growing of livestock developed 8,000 years ago. Gardening was practiced along the Caspian Sea 6,000 BC. Early Greeks produced olives and vines. Romans baked good bread. Market gardens flourished in the Middle Ages. Spice trade developed in the 1400's. New world produced corn, tomatoes, tobacco, etc. in the 1500's. Technology producing new foods - 1950.

13. Given a list of farming tools and implements, student will be able to assemble them in a correct time line, from historical to present.

14. Do a "box" or "roll up" movie on the life of George Washington Carver, famous American black scientist who did so much research on the uses of peanuts, a crop easily grown in the South. Peanuts are a high protein source, and peanut oil is used for everything from cooking to paints. To make the movie decide what episodes of his life you would like to show. Get a box--anything from a shoe box up--cut off one end (this will be the screen), and make a good size "peep hole" in the other end. Decide what episodes of Carver's life you wish to portray. Draw them on a long piece of paper which fits the depth of your box. If a long

piece of paper is not available, paste pieces together. Add captions or make your people talk the way they do in the comics. Fasten the ends of the drawings to sticks or dowels. Roll up your movie on one of the sticks. Now, by holding the rolled up spool of drawings in your left hand and rolling the paper on to the right hand dowel across the cut off end of the box, your "movie" will "move." Show your movie to your classmates by having them look into the peep hole.

15. What are some of the factors which influence man's eating practices? Make a list of them (geography, culture, religion, age, tradition, technology, etc.--there are a lot more.) Select one and illustrate it with a line drawing, pastel, crayon or water color. Make a display of all the pictures done by class members. Make a large heading to be placed above the display which will identify the illustrations.

16. Tell in your own words how farming is different today from what it was at an earlier time. Don't only tell what you think. Tell what you know!

OBJECTIVE: Investigate the problems of hunger and malnutrition within the United States and some of the food programs designed to alleviate those problems.

PROBLEM AREA: Hunger in the United States.

GRADE LEVEL: 7-12

SUBJECT: Social Studies, Health, Home Economics, Economics

ACTIVITIES:

1. It has been suggested that ten million Americans are malnourished. That is a staggering number and quite shocking to many well-fed Americans who believe malnourished people live only in undeveloped countries. Do some research on this topic and report to your class.

2. Do some research on the problem of higher food costs in inner cities where many poor people live. There are some reasons for this offensive practice. If you can actually visit some inner city stores to check prices, do so. Can you offer any solutions?

3. Sometimes, oddly enough, malnutrition shows up in in people who are economically well off and who live in areas where food is plentiful. This is largely because are uneducated about proper diet. Read about malnourishment among teenagers in the United States. Share your report with your classmates.

4. The sharp increase in food prices has affected the diet of low and moderate income families in our country. Can you suggest some solutions? (Cutting down advertising costs which would bring prices down might be one solution.)

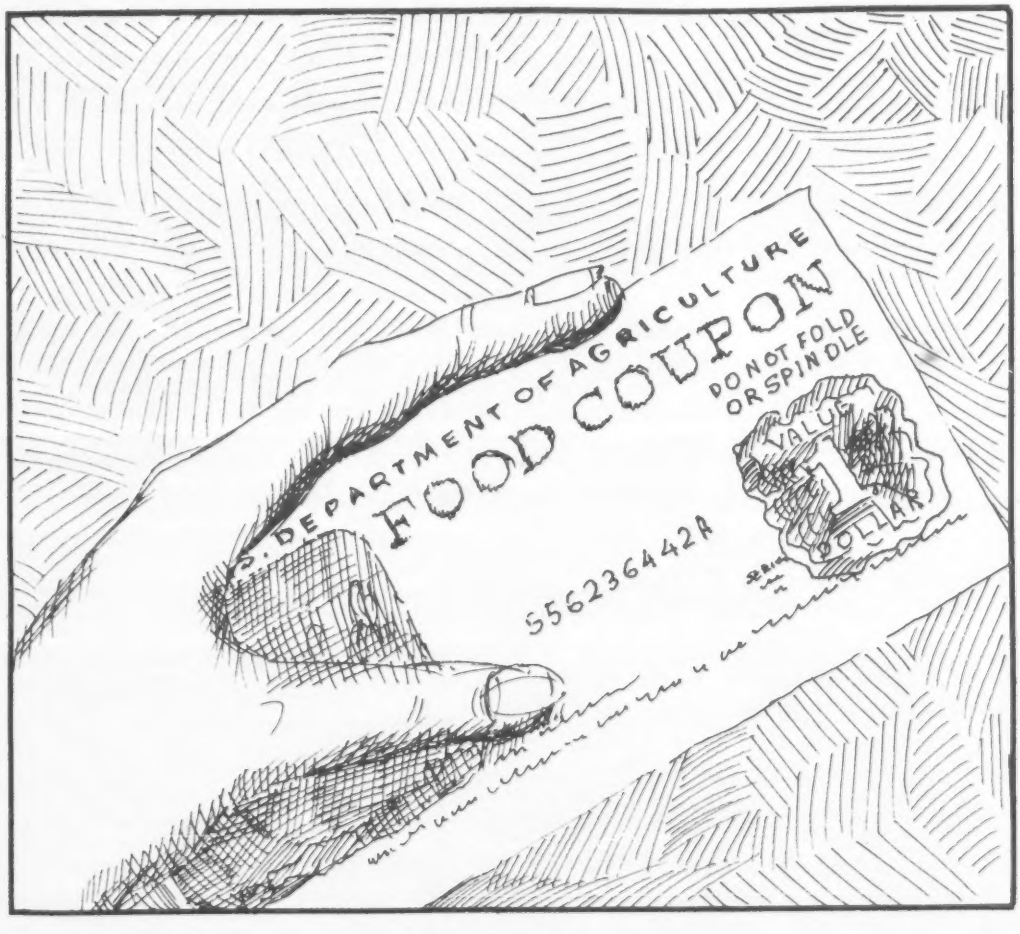
5. The government has programs to aid people in their nutritional needs. Set up classroom committees to investigate these programs and report to the class. Food stamps, food donation programs, supplemental programs, child feeding programs, school lunch programs, senior citizens lunch programs, etc.

6. There is no food shortage in America yet malnutrition and under nourishment continue due to two factors: lack of income, lack of simple knowledge concerning diet and nutrition. Make posters advertising the importance of proper diet. Perhaps the nurse will help you distribute the posters around your school building.

7. A prevalent form of malnutrition in the United States is obesity. It may stem from overnutrition, nutrient imbalance, sedentary living or a variety of other causes. See if you can find some information on this topic share with you class. (Caution - be sensitive to anyone in your class who has this problem.)

8. Name four or five problems related to food and malnutrition within the U.S.A.

9. Name two food programs currently used in the United States to alleviate hunger. Explain how they work.



INTERESTING SUPPLEMENTARY REFERENCES

BOOKLET: The World Food Situation and Prospects to 1985. Economic Research Service. Foreign Agricultural Economic Report No. 98, U. S. Department of Agriculture, Washington, D. C. 20250. Free. An indispensable aid for the study of the food unit. Chapters on Nutrition, Food Aid, Diversity Among Developing Countries, The World Food Conference, Projected World Food Supply and Demand, etc. Contains many diagrams, tables and graphs.

PAMPHLET: From the Earth to Your Table. Office of Communications, U. S. Dept. of Agriculture, Washington, D. C. 20250. Free. Six activity master units each of which will produce 200 copies. Who shares the money you spend on food? How does processing affect the cost? Etc. Two transparencies showing the effects of U. S. Agriculture on the American economy and the rest of the world. There are 8 other free pamphlets in this series. All excellent.

BULLETIN: American Freedom From Hunger Foundation, 1625 I Street, N. W. Washington, D. C. 20006; Gerald Connolly, executive director (202) 254-3487. Issues of global development such as food, population and hunger are examined. The monthly Bulletin ($5) is available to members. The Issue Pack on World Hunger ($1.50) contains fact sheets, articles, and a bibliography.

FILM: Beyond the Next Harvest, 1975, 27 min., color, $25 rental, $300 purchase. Mass Media Ministries, Inc., 2116 North Charles Street, Baltimore, Md. 21218. Visual statements of world hunger, interviews with 1974 World Food Conference delegates (Lester Brown, Barbara Ward, Jean Mayer, and Sayed Marei) and factual narration by Norman Cousins mesh to show concern for survival.

GAME: BALDICER. John Knox Press, Box 1176, Richmond, Va. 23209. $25.00. A simulation game on feeding the world's people. 10-20 participants gain understanding of the world's economic interdependence and of food production, population growth, inflation, mechanization, and distribution of world resources.

MAGAZINE: Science Magazine, May 9, 1975, Vol. 188, No. 4188, American Association for the Advancement of Science, 1515 Massachusetts Avenue, N.W., Washington, D. C. 20005. This complete issue is devoted to food. Areas explored are: (1) Food: Economics, Politics and Social Structure, (2) Nutrition, (3) Agricultural Research, and (4) Basic Biology. Articles are written by authorities. Highly recommended for the classroom teacher.

BOOK: Earth, Our Crowded Spaceship, by Issac Asimov, 1974. John Day Company, 666 Fifth Avenue, New York, N. Y. 10019. 160 pp., $2.50. Discussion in this textbook centers on the problems faced by Earth's inhabitants as population increases and energy sources, food, and land become more scarce. The conversational tone draws the students into a reasoned examination of these critical issues. Illustrated by photographs, graphs, and charts.

BOOK: Things to Come, The World Food Crisis--The Way Out, by The Food and Agriculture Organization, United Nations, 1974. UNIPUB, P. O. Box 433, Murray Hill Station, New York, N. Y. 10016. 50 pp., $1.00. Introduction to the background and issues of the current world food shortage. Incorporates the main topics of debate at the 1974 World Food Conference held in Rome. Contrasts the well-fed and hungry worlds from many aspects: supply, technology, distribution, production, and prices.